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(54) **INTERFACE SYSTEMS FOR PORTABLE DIGITAL MEDIA STORAGE AND PLAYBACK DEVICES**

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(51) **Int. Cl.**
G06F 13/00 (2006.01)

(52) **U.S. Cl.** **710/303**; 386/219; 386/231; 386/234; 455/39; 455/41.2; 715/864

(58) **Field of Classification Search** 386/46, 386/83, 95, 96, 200, 213, 216, 219, 231, 386/234; 715/864; 710/303; 455/39, 41.2; 713/189, 193

See application file for complete search history.

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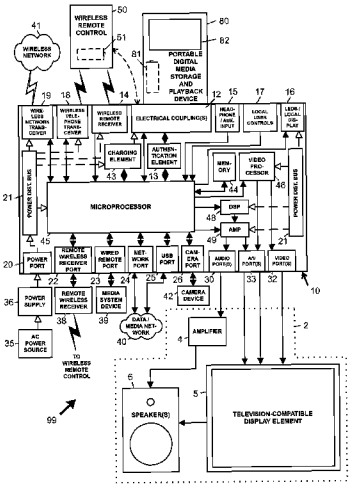
Primary Examiner — Thai Tran
Assistant Examiner — Mishawn Dunn

(57) **ABSTRACT**

A docking assembly serves as an interface between (1) a portable digital media storage and playback (PDMSP) device, and (2) a media reproduction system. A remote controller preferably controls the docking assembly and PDMSP device, which may receive electric charge from the assembly. Media reproduction systems may reproduce audio and video signals in user-perceptible form. Telephonic relay capability is further provided between a telephonic PDMSP playback device and a telephonic remote controller by way of a telephone rebroadcast receiver associated with the docking assembly. Methods for downloading digital media files, and for creating or modifying playlists with a remotely controllable docking assembly adapted to provide a television-compatible video output signal, are further provided.

23 Claims, 11 Drawing Sheets



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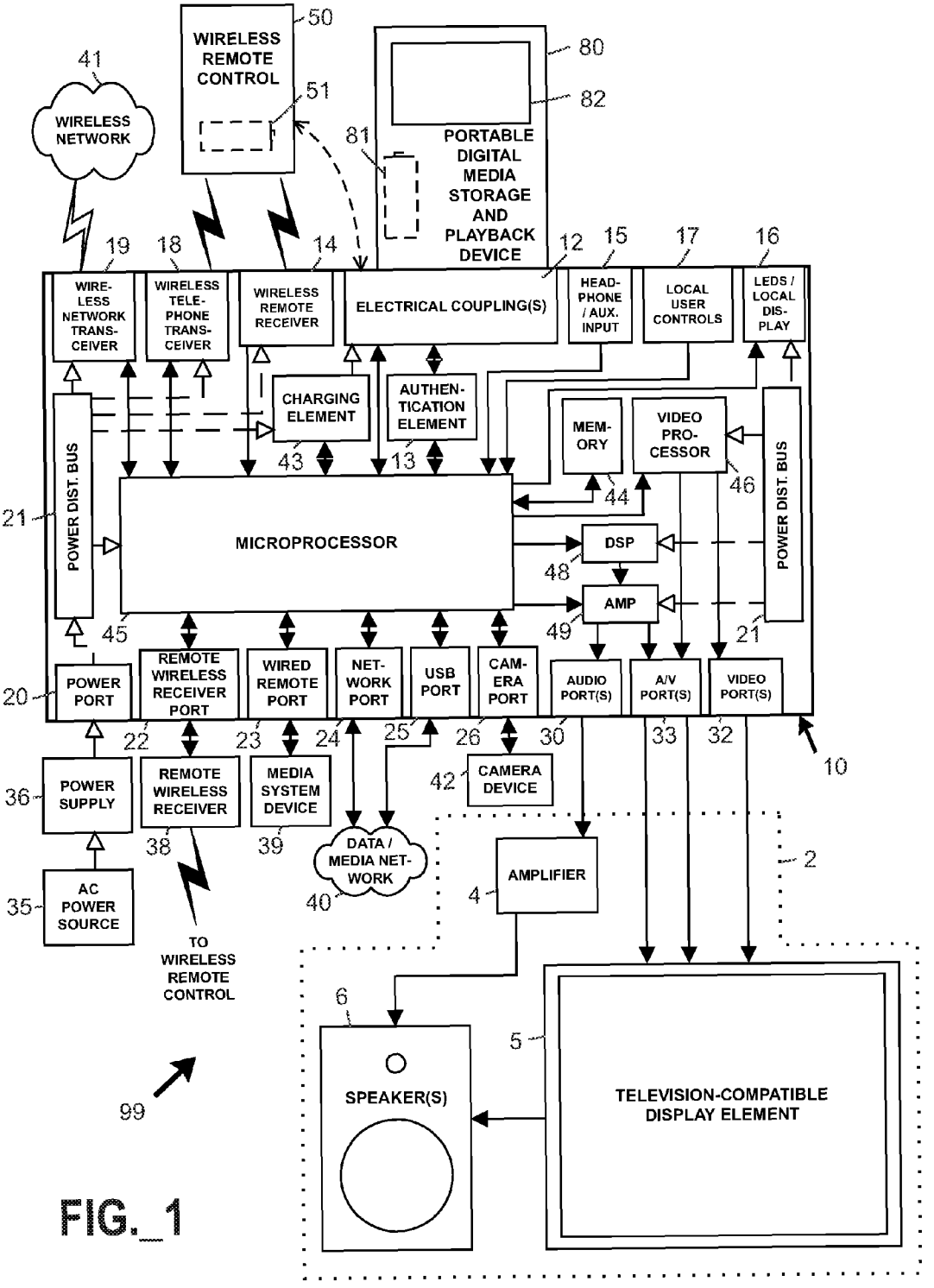
WIRELESS REMOTE CONTROL
50
51
41
WIRELESS NETWORK
80
82
81
PORTABLE DIGITAL MEDIA STORAGE AND PLAYBACK DEVICE
19
18
14
12
15
17
16
WIRE-LESS NETWORK TRANS-CEIVER
WIRELESS TELE-PHONE TRANS-CEIVER
WIRELESS REMOTE RECEIVER
ELECTRICAL COUPLING(S)
HEAD-PHONE / AUX. INPUT
LOCAL USER CONTROLS
LEDS / LOCAL DIS-PLAY
CHARGING ELEMENT
AUTHEN-TICATION ELEMENT
MEM-ORY
VIDEO PRO-CESSOR
43
13
44
46
POWER DIST. BUS
21
MICROPROCESSOR
DSP
48
AMP
49
45
POWER PORT
20
REMOTE WIRELESS RECEIVER PORT
WIRED REMOTE PORT
NET-WORK PORT
USB PORT
CAM-ERA PORT
AUDIO PORT(S)
A/V PORT(S)
VIDEO PORT(S)
22
23
24
25
26
30
33
32
10
POWER SUPPLY
36
REMOTE WIRELESS RECEIVER
38
MEDIA SYSTEM DEVICE
39
CAMERA DEVICE
42
DATA / MEDIA NET-WORK
40
AMPLIFIER
4
2
AC POWER SOURCE
35
TO WIRELESS REMOTE CONTROL
6
5
SPEAKER(S)
TELEVISION-COMPATIBLE DISPLAY ELEMENT
99

FIG._1

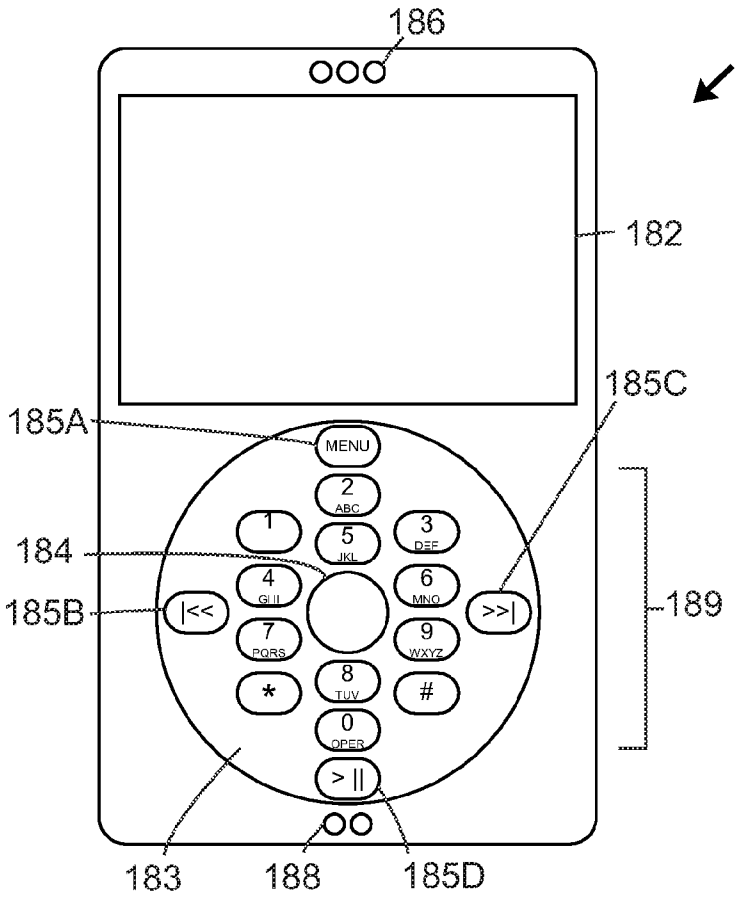
186
180
182
185C
185A
MENU
2 ABC
1
5 JKL
3 DEF
184
4 GHI
6 MNO
185B
|<<
>>|
189
7 PQRS
9 WXYZ
8 TUV
*
#
0 OPER
> ||
183
188
185D

FIG._2A

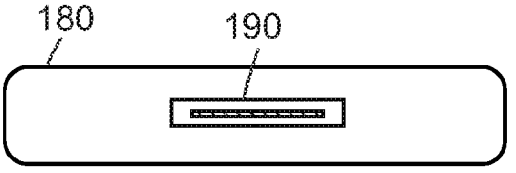
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FIG._2B

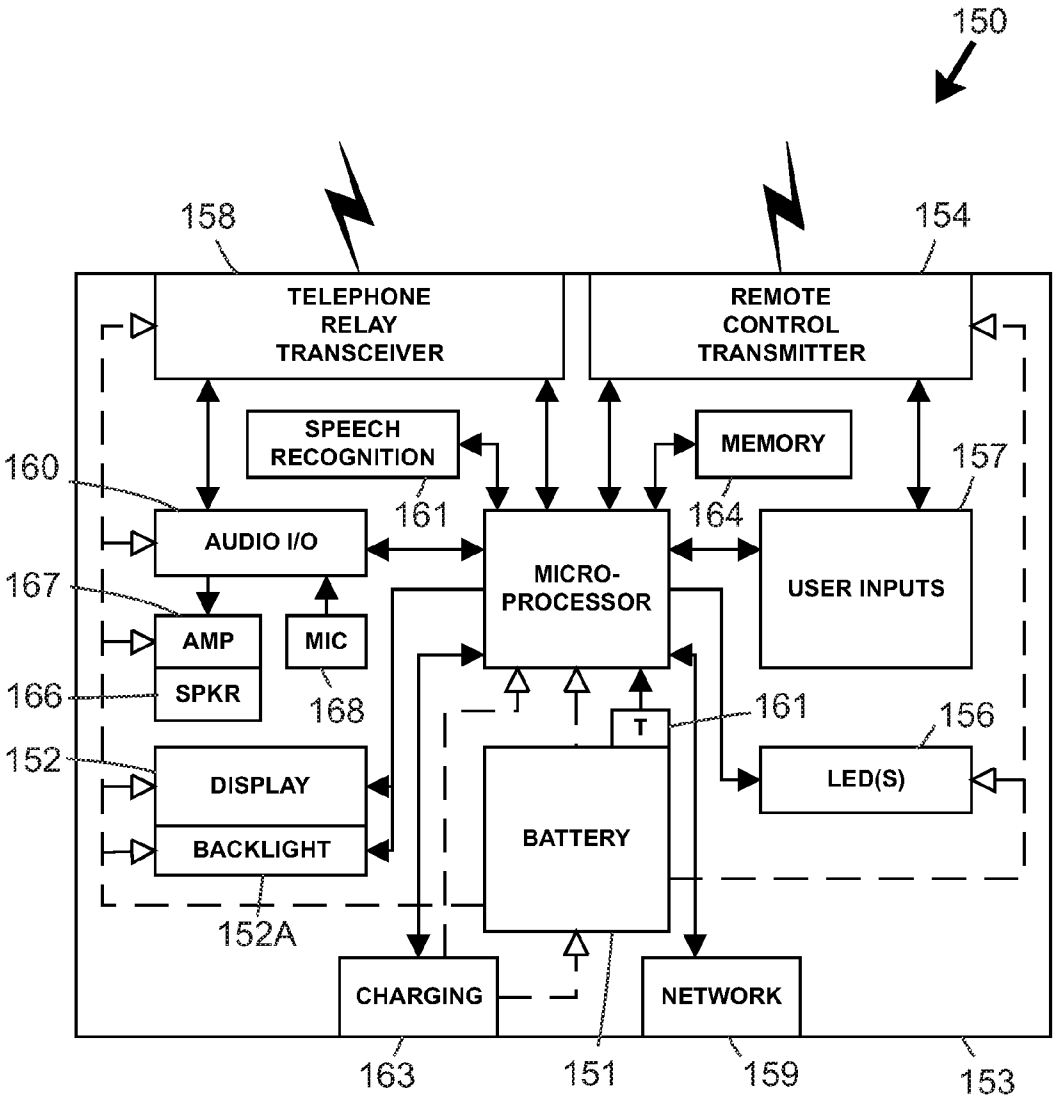
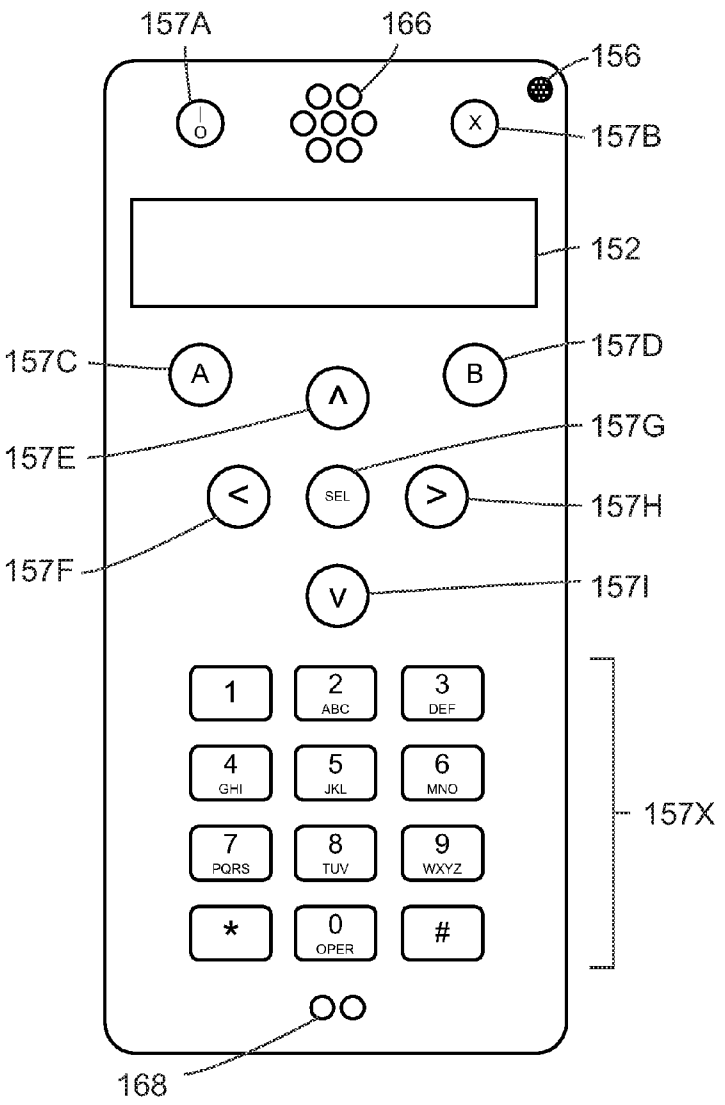

150
158
154
TELEPHONE RELAY TRANSCEIVER
REMOTE CONTROL TRANSMITTER
SPEECH RECOGNITION
MEMORY
160
161
164
157
AUDIO I/O
MICRO-PROCESSOR
USER INPUTS
167
AMP
MIC
SPKR
166
168
T
161
156
152
DISPLAY
LED(S)
BACKLIGHT
BATTERY
152A
CHARGING
NETWORK
163
151
159
153

FIG._3


157A
166
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156
O
X
157B
152
157C
A
B
157D
^
157E
157G
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SEL
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157H
157F
V
157I
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
157X
7 PQRS
8 TUV
9 WXYZ
*
0 OPER
#
168

FIG._4A

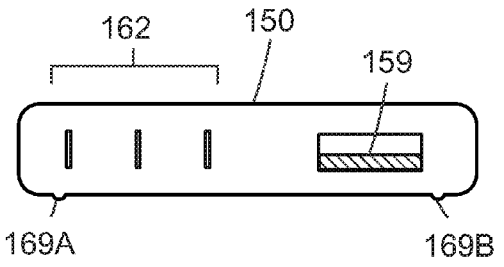

162
150
159
169A
169B

FIG._4B

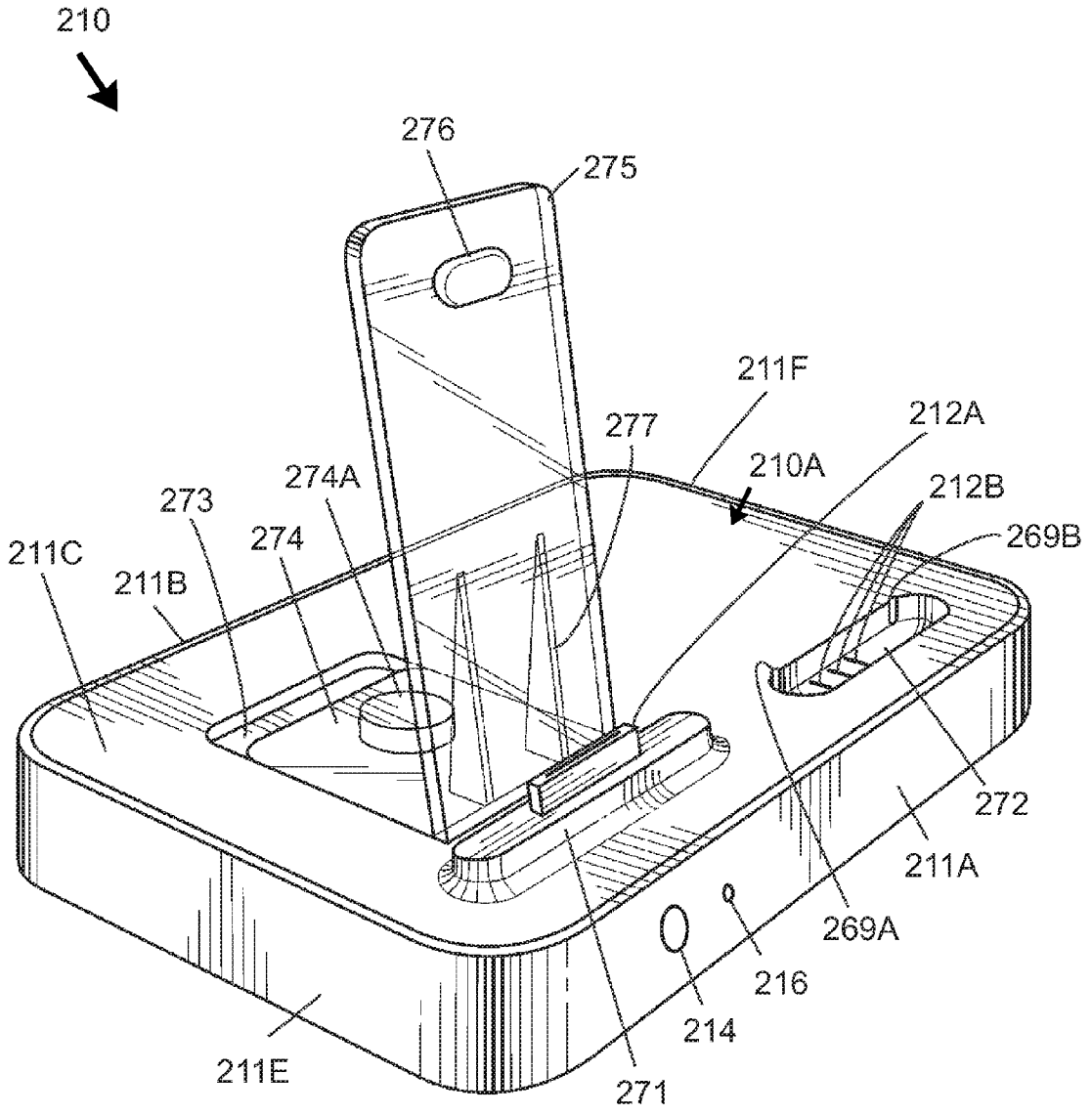
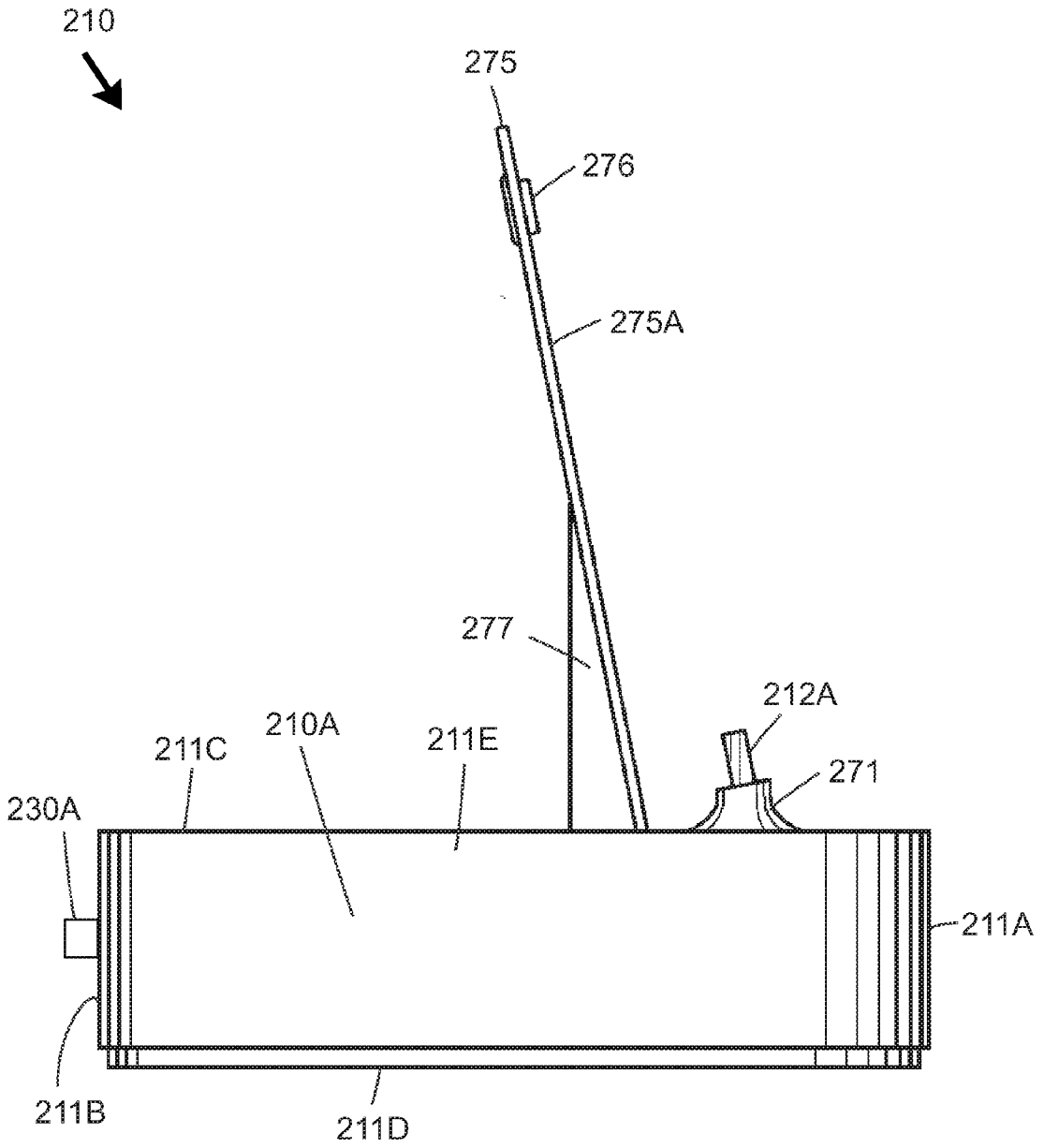

210
276
275
211F
277
212A
210A
212B
274A
273
274
269B
211C
211B
272
211A
269A
216
214
211E
271

FIG._5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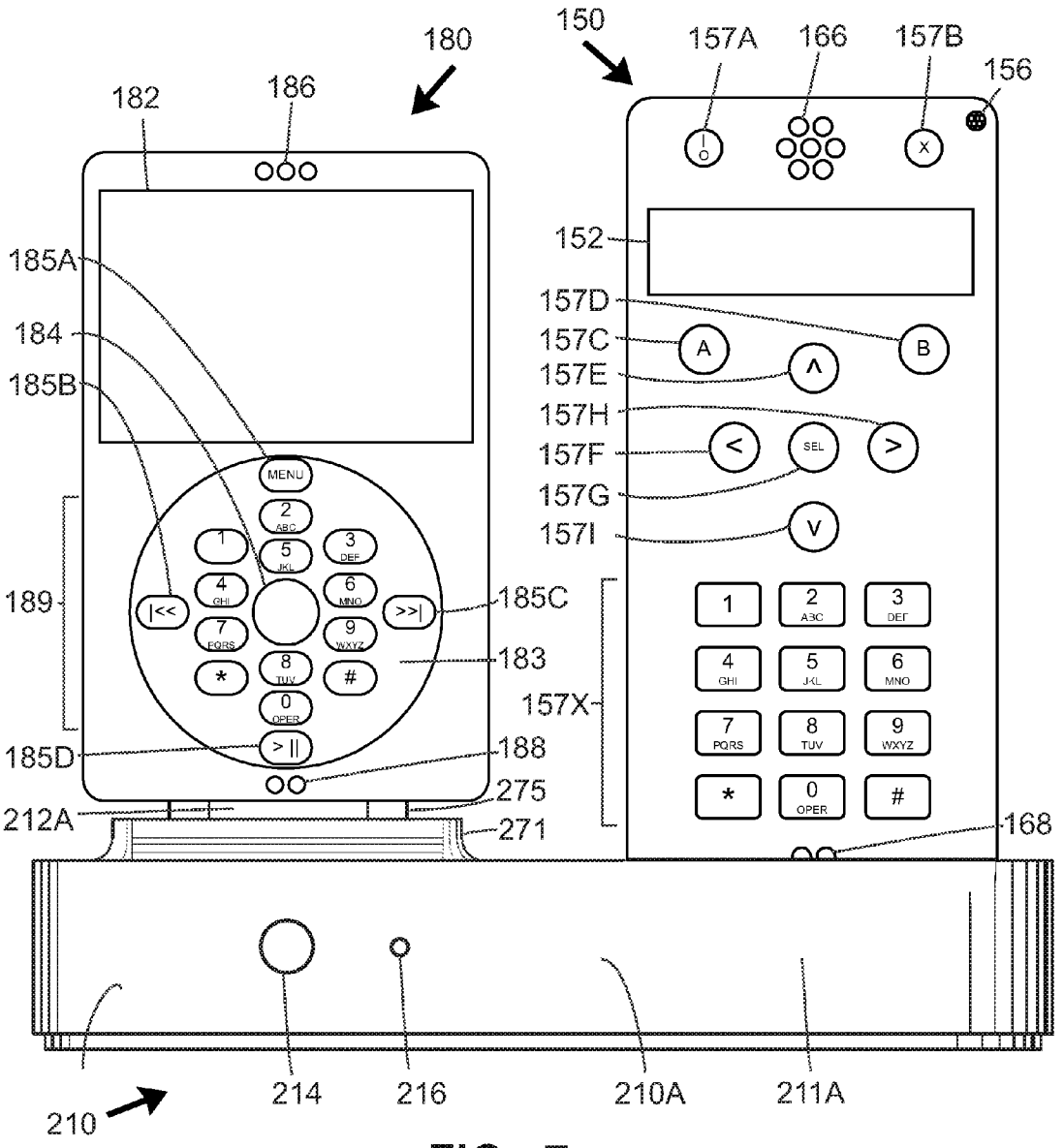
212A
271
211C
210A
211E
230A
211A
211B
211D

FIG._6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182
186
157A
166
157B
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185A
184
185B
152
157D
157C
157E
157H
157F
157G
157I
189
185C
183
157X
185D
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212A
271
168
210
214
216
210A
211A

FIG. 7

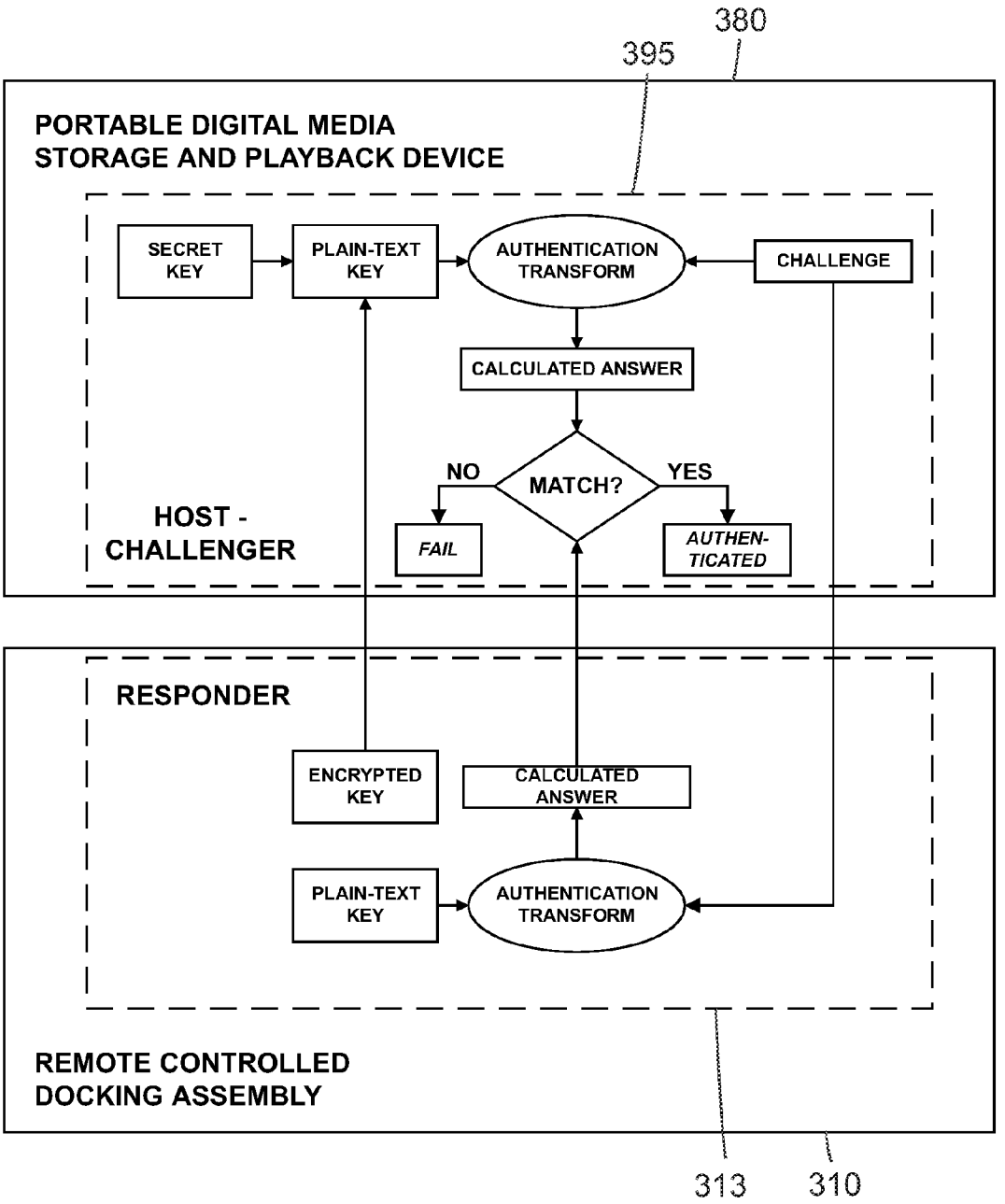
380
395
PORTABLE DIGITAL MEDIA
STORAGE AND PLAYBACK DEVICE
SECRET KEY
PLAIN-TEXT KEY
AUTHENTICATION TRANSFORM
CHALLENGE
CALCULATED ANSWER
NO
MATCH?
YES
HOST - CHALLENGER
FAIL
AUTHEN-TICATED
RESPONDER
ENCRYPTED KEY
CALCULATED ANSWER
PLAIN-TEXT KEY
AUTHENTICATION TRANSFORM
REMOTE CONTROLLED
DOCKING ASSEMBLY
313
310

FIG._8

FIG._9A

FIG._9B

FIG._9C

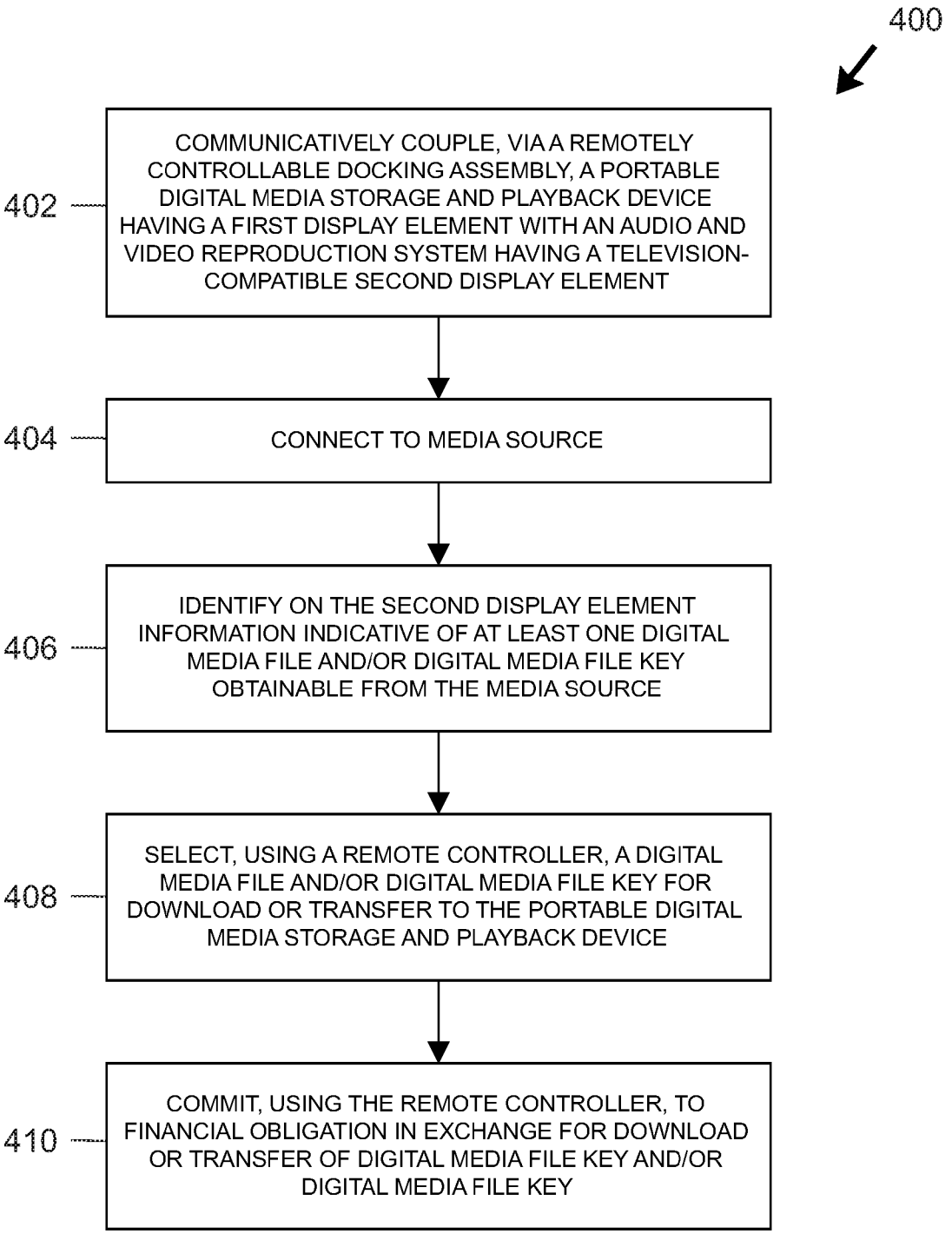
400
402
COMMUNICATIVELY COUPLE, VIA A REMOTELY CONTROLLABLE DOCKING ASSEMBLY, A PORTABLE DIGITAL MEDIA STORAGE AND PLAYBACK DEVICE HAVING A FIRST DISPLAY ELEMENT WITH AN AUDIO AND VIDEO REPRODUCTION SYSTEM HAVING A TELEVISION-COMPATIBLE SECOND DISPLAY ELEMENT
404
CONNECT TO MEDIA SOURCE
406
IDENTIFY ON THE SECOND DISPLAY ELEMENT INFORMATION INDICATIVE OF AT LEAST ONE DIGITAL MEDIA FILE AND/OR DIGITAL MEDIA FILE KEY OBTAINABLE FROM THE MEDIA SOURCE
408
SELECT, USING A REMOTE CONTROLLER, A DIGITAL MEDIA FILE AND/OR DIGITAL MEDIA FILE KEY FOR DOWNLOAD OR TRANSFER TO THE PORTABLE DIGITAL MEDIA STORAGE AND PLAYBACK DEVICE
410
COMMIT, USING THE REMOTE CONTROLLER, TO FINANCIAL OBLIGATION IN EXCHANGE FOR DOWNLOAD OR TRANSFER OF DIGITAL MEDIA FILE KEY AND/OR DIGITAL MEDIA FILE KEY

FIG._10

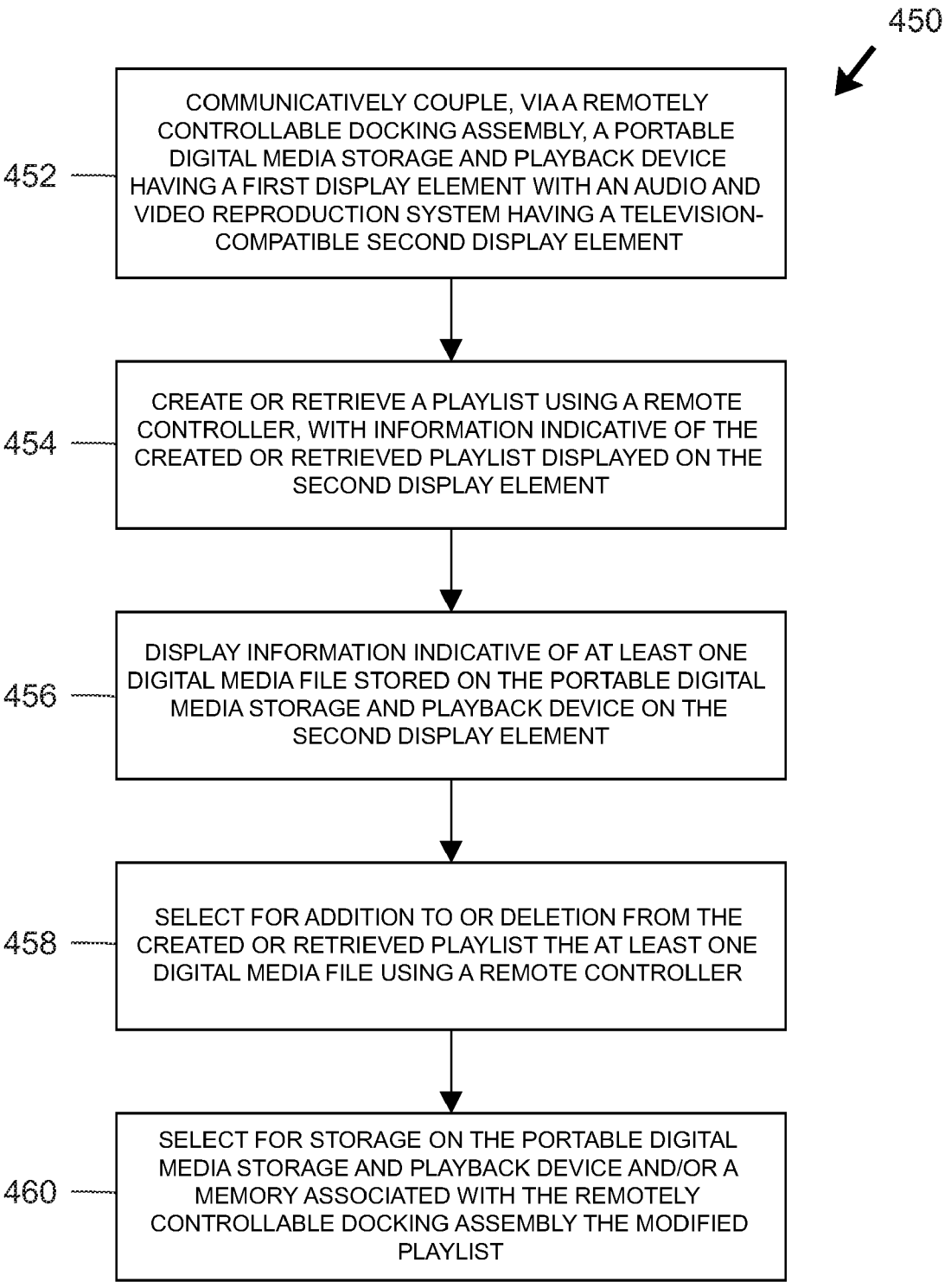
450
452
COMMUNICATIVELY COUPLE, VIA A REMOTELY CONTROLLABLE DOCKING ASSEMBLY, A PORTABLE DIGITAL MEDIA STORAGE AND PLAYBACK DEVICE HAVING A FIRST DISPLAY ELEMENT WITH AN AUDIO AND VIDEO REPRODUCTION SYSTEM HAVING A TELEVISION-COMPATIBLE SECOND DISPLAY ELEMENT
454
CREATE OR RETRIEVE A PLAYLIST USING A REMOTE CONTROLLER, WITH INFORMATION INDICATIVE OF THE CREATED OR RETRIEVED PLAYLIST DISPLAYED ON THE SECOND DISPLAY ELEMENT
456
DISPLAY INFORMATION INDICATIVE OF AT LEAST ONE DIGITAL MEDIA FILE STORED ON THE PORTABLE DIGITAL MEDIA STORAGE AND PLAYBACK DEVICE ON THE SECOND DISPLAY ELEMENT
458
SELECT FOR ADDITION TO OR DELETION FROM THE CREATED OR RETRIEVED PLAYLIST THE AT LEAST ONE DIGITAL MEDIA FILE USING A REMOTE CONTROLLER
460
SELECT FOR STORAGE ON THE PORTABLE DIGITAL MEDIA STORAGE AND PLAYBACK DEVICE AND/OR A MEMORY ASSOCIATED WITH THE REMOTELY CONTROLLABLE DOCKING ASSEMBLY THE MODIFIED PLAYLIST

FIG._11

INTERFACE SYSTEMS FOR PORTABLE DIGITAL MEDIA STORAGE AND PLAYBACK DEVICES

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to accessories for portable digital media storage and playback devices used for on-line downloading, storing and playing digital media files such as, for example, MP3 (i.e., MPEG-1 audio layer 3) audio, WMA (Windows Media Audio) audio, MPEG-4 multimedia, and QuickTime multimedia files. More specifically, the invention relates in various aspects to a multi-function docking assembly, preferably remotely controllable, providing any of the following functions: signal transmission, signal relaying, remote control, remote video interface, power supply and/or charging, and authentication for portable digital media storage and playback devices, and methods pertaining to the same.

2. Description of the Related Art

Media players of various types are ubiquitous throughout the world, and have evolved through various forms over the years, from portable single transistor radios in the 1950's to tape cassette players, to compact disc players, and more recently to portable digital media storage and playback devices that enable a user to obtain digital media files (e.g., by download from an Internet site) and store same in storage medium of a player in any of various preferably compressed formats for subsequent selective playback.

Preferred digital media storage and playback devices utilize hard drives and/or flash memory to store digital media files. A number of digital media storage and playback devices have been developed and are commercially available, including: the iPod® family of products manufactured by Apple Computer, Inc.; the iRiver® family of products manufactured by iRiver Inc.; the Nomad™, Zen™ and MuVo® families of products manufactured by Creative Technology, Ltd.; the Rio® family of products manufactured by Digital Networks North America, Inc.; the DJ™ family of products manufactured by Dell Computer, Inc.; the Lyra® family of products manufactured by RCA/Thomson Multimedia, Inc.; and the Yepp'® and neXus™ families of products manufactured by Samsung Electronics Co., Ltd. Such devices having varying capacities but models permitting the storage of approximately 1000 or more commercial play length audio files are commonplace. Substantial memory capacity may be provided by the presence of a hard disk and/or flash memory, with certain models enabling the removal of flash memory cards in formats such as Secure Digital or Compact Flash. Digital media storage and playback device models having sophisticated displays are further able to store and playback image and/or video files.

Media storage and playback devices of the aforementioned type rely on batteries for their portability, and are typically provided with a headphones jack to which headphones may be connected to provide personal entertainment.

One problem associated with the small size and light-weight characteristics of portable digital media storage and playback ("PDMSP") devices, as requisite to their portability and ease of use, is battery life. Another problem is the personal character of the headphone-equipped PDMSP devices. A PDMSP device may be equipped with a video display and a speaker, but its small size and light-weight characteristics limit the size of the display and speaker, making it less than desirable when a user seeks to transmit audio or video from the PDMSP device to a group of persons, such as in a room or in the passenger compartment of a passenger vehicle.

Another limitation associated with conventional PDMSP devices is their reliance on personal computers as a primary interface for loading, purchasing, and organizing media files. Aside from the expense attendant to personal computers, such devices are often tailored for and stationed in rooms designated for work—such as offices—and may be difficult to integrate with multimedia (e.g., television, audio, and communication) entertainment devices tailored for and stationed in rooms designated for recreation—such as living rooms or home theaters. An owner of a personal computer may desire to unwind by purchasing or organizing multimedia files for storage and viewing on a PDMSP device, yet avoid the process altogether so as to avoid the temptation to check email messages as they arrive to the computer. Additionally, furnishings in entertainment rooms such as living rooms and home theaters usually are substantially more inviting and comfortable than office chairs. Thus, a highly functional accessory device for interfacing with PDMSP devices, with such accessory being suitable for use in entertainment rooms and not requiring use of a personal computer, would be desirable.

Yet another limitation associated with conventional PDMSP devices is their absorptive entertainment quality, leading to the occasional difficulty of alerting the user to potentially important interruptions such as telephone calls. It would be desirable to provide an accessory device capable of alerting a PDMSP user to the existence of a potential interruption such as an incoming telephone call, of permitting the user to rapidly determine whether to receive the incoming call, and to conveniently initiate acceptance of the call while pausing or muting media playback to minimize conversational distraction.

Various accessories have been developed for use with PDMSP devices. For manufacturers and purchasers of PDMSP devices, it would be desirable to ensure and/or regulate interoperability between such devices and accessories intended to connect therewith. For example, the original equipment manufacturer (OEM) of a PDMSP device may wish to avoid warranty claims and/or reputational damage that might result due to operating problems or hardware failures (e.g., inferior sound quality, battery overcharging, etc.) when the PDMSP device is connected with an accessory device of questionable quality sourced by a supplier of unknown repute. It may be difficult for an end user to determine the quality of an accessory device without purchasing the accessory and possibly learning "the hard way," i.e., through failure of the accessory or damage to the PDMSP device. Additionally, or alternatively, the PDMSP device OEM may wish to regulate the interoperability of accessories with the PDMSP device to derive additional revenue by producing accessories itself or by licensing to third parties the right to produce such accessories. Restricting by license the availability to preferred third party accessory manufacturers of proprietary interface components such as connectors can provide some degree of control to PDMSP device OEMs in this regard; however, such tactics may be circumvented by unlicensed parties with relative ease by copying such interface connectors.

Accordingly, there exists a need for improved accessories for use with portable digital media storage and playback devices.

SUMMARY OF THE INVENTION

In a first aspect of the invention, a docking assembly adapted for use in interfacing (1) a portable digital media

storage and playback device having a first display element with (2) an audio and video reproduction system having a television-compatible second display element and a first audio amplifier adapted to drive at least one speaker, comprises: an electrical coupling adapted to engage the portable digital media storage and playback device; a microprocessor adapted to communicate with the portable digital media storage and playback device through the electrical coupling; a remote control receiver adapted to receive an input signal from a wireless remote controller device and to provide an output signal to the microprocessor; an audio output port adapted to communicate an audio signal to the first audio amplifier; a video output port adapted to communicate a television-compatible video signal to the second display element; a video processor in communication with the microprocessor, the video processor being adapted to communicate to the video output port a television-compatible video signal indicative of a signal received from the portable digital media storage and playback device for display by the second display element; and a unitary body structure, wherein the electrical coupling, microprocessor, audio output port, video output port, and video processor are disposed in or on the unitary body structure.

In another aspect of the invention, a docking assembly adapted for use in interfacing (1) a telephonic portable digital media storage and playback device having a first display element with (2) a media reproduction system having a first audio amplifier adapted to drive at least one speaker, comprises: an electrical coupling adapted to engage the portable digital media storage and playback device; a microprocessor adapted to communicate with the portable digital media storage and playback device through the electrical coupling; a remote control receiver adapted to receive an input signal from a wireless remote controller device and provide an output signal to the microprocessor; an audio output port adapted to communicate an audio signal to the first audio amplifier; and a telephone rebroadcast transceiver adapted to wirelessly communicate telephonic signals between (a) the telephonic portable digital media storage and playback device, and (b) the remote controller device.

In another aspect of the invention, a docking assembly adapted for use in interfacing (1) a telephonic portable digital media storage and playback device with (2) a media reproduction system having a first audio amplifier adapted to drive at least one speaker, comprises: an electrical coupling adapted to engage the portable digital media storage and playback device; a microprocessor adapted to communicate with the portable digital media storage and playback device through the electrical coupling; a remote control receiver adapted to receive an input signal from a wireless remote controller device and adapted to provide an output signal to the microprocessor; an audio output port adapted to communicate an audio signal to the first audio amplifier; and a signal transmitter adapted to wirelessly communicate a signal indicative of a telephonic signal from the telephonic portable digital media storage and playback device to the remote controller device.

In another aspect of the invention, a remote controller device adapted to control any of a telephonic portable digital media storage device, a media reproduction system, and a docking assembly adapted for use in interfacing the telephonic portable digital media storage device with the media reproduction system, comprises: a wireless signal receiver adapted to receive a telephonic signal from the docking assembly; a speaker adapted to reproduce an audible signal indicative of the received telephonic signal; a voice transducer adapted to produce an electrical vocal output signal; a first wireless signal transmitter communicatively coupled to the voice transducer and adapted to transmit a telephonic signal indicative of the electrical vocal output signal; a second wireless signal transmitter adapted to provide a control signal to the docking assembly; and a charge storage element suitable to provide electric power to any of the signal receiver, the speaker, the first signal transmitter, and the second signal transmitter.

In another aspect of the invention, a method for selecting a digital media file for download or transfer includes the steps of: (A) communicatively coupling, via a remotely controllable docking assembly, (1) a portable digital media storage and playback device having a first display element, with (2) an audio and video reproduction system having a television-compatible second display element and a first audio amplifier adapted to drive at least one speaker, wherein the docking assembly comprises (i) a video output port adapted to communicate a television-compatible video signal to the second display element, and (ii) a video processor adapted to communicate to the video output port a television-compatible video signal indicative of a signal received from the portable digital media storage and playback device for display by the second display element, and wherein the docking assembly has an associated remote controller; (B) identifying on the second display element information indicative of any of (1) a digital media file, and (2) a digital media file key, as available for download or transfer to the portable digital media storage and playback device; and (C) selecting for download or transfer of any of the digital media file and the digital media file key using the remote controller.

In another aspect of the invention, a method of selecting at least one digital media file for addition to a playlist includes the steps of: (A) communicatively coupling, via a remotely controllable docking assembly, (1) a portable digital media storage and playback device having a first display element, with (2) an audio and video reproduction system having a television-compatible second display element and a first audio amplifier adapted to drive at least one speaker, wherein the docking assembly comprises (i) a video output port adapted to communicate a television-compatible video signal to the second display element, and (ii) a video processor adapted to communicate to the video output port a television-compatible video signal indicative of a signal received from the portable digital media storage and playback device for display by the second display element, and wherein the docking assembly has an associated remote controller; (B) identifying on the second display element information indicative of at least one digital media file; and (C) selecting for addition to a playlist the at least one digital media file using the remote controller.

In another aspect of the invention, a docking assembly is coupleable with a PDMSP device having an electrical coupling and an electrical charge storage element, and the docking assembly comprises: (A) a body having a support element and an electrical connector, wherein the support element is adapted to receive at least a portion of the portable digital media storage and playback device, and the electrical connector is adapted to simultaneously engage the electrical coupling when the at least a portion of the portable digital media storage and playback device is received by the support element; (B) at least one electrical circuit element adapted to conduct power from an external power source to the at least one electrical coupling for any of (1) powering the portable digital media storage and playback device, and (2) charging the electrical charge storage element; and (C) at least one communication element adapted to communicate a signal indicative of digital media content played by the portable

digital media storage and playback device to a media signal reproduction system having an amplifier and at least one speaker, wherein the media reproduction system is adapted to reproduce the signal indicative of digital media content in user-perceptible form. Such embodiment may further include circuitry adapted to control operation of a user-perceptible display element.

Another aspect of the invention relates to the addition of authentication elements and steps to the foregoing devices and methods.

In another aspect of the invention, any of the foregoing aspects may be combined for additional advantage.

Other aspects, features and embodiments of the invention will be more fully apparent from the ensuing disclosure and appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block schematic view of a docking assembly controllable via a remote controller and adapted for use in interfacing a portable digital media storage and playback device with an audio and video reproduction system having a television-compatible display element, the combination of elements comprising an entertainment system.

FIG. **2**A is a front elevation view of a telephonic portable digital media storage and playback device.

FIG. **2**B is a bottom view of the telephonic portable digital media storage and playback device of FIG. **2**A.

FIG. **3** is a schematic view of a remote controller device for use with a docking assembly adapted to receive a telephonic portable digital media storage and playback device, the remote controller device having an integral telephone relay transceiver, a microphone, and a speaker.

FIG. **4**A is a front elevation view of the remote controller device of FIG. **3**.

FIG. **4**B is a bottom view of the remote controller device of FIG. **4**A.

FIG. **5** is a perspective view of a docking assembly controllable via a wireless remote controller (such as the controller of FIGS. **4**A-**4**B) and adapted for use in interfacing a portable digital media storage and playback device (such as the portable digital media storage and playback device of FIGS. **2**A-**2**B) with an audio and video reproduction system having a television-compatible display element.

FIG. **6** is a left side elevation view of the docking assembly of FIG. **5**.

FIG. **7** is a front view of the docking assembly of FIGS. **5**-**6** having docked thereto the portable digital media storage and playback device of FIGS. **2**A-**2**B and the remote controller device of FIGS. **4**A-**4**B.

FIG. **8** is a functional block diagram for an authentication scheme that may be utilized by and between a remote controlled docking assembly according to the present invention and a portable digital media storage and playback device.

FIG. **9**A is a first screen shot taken from a television-compatible display element receiving a signal from a docking assembly according to the present invention and having a portable digital media storage device docked thereto, the first screen shot showing a welcome menu in a central right portion of the screen.

FIG. **9**B is a second screen shot taken from a television-compatible display element receiving a signal from a docking assembly according to the present invention and having a portable digital media storage device docked thereto, the second screen shot showing a digital media file artist name, song title, album name, song play position, and song length information in an upper portion of the screen, and a settings menu in a central right port of the screen.

FIG. **9**C is a third screen shot taken from a television-compatible display element receiving a signal from a docking assembly according to the present invention and having a portable digital media storage device docked thereto, the third screen shot showing a music menu (inclusive of playlists, artists, albums, songs, genres, composers, and songbooks submenus) in a central right port of the screen.

FIG. **10** is a flowchart of various steps of a method employing a remote controller and a remotely controlled docking assembly as disclosed herein for purchasing digital media files and/or digital media file keys for download or transfer to a portable digital media storage device.

FIG. **11** is a flowchart of various steps of a method employing a remote controller and a remotely controlled docking assembly as disclosed herein for creating, modifying, and storing playlists of digital media files useable with a portable digital media storage device.

DETAILED DESCRIPTION OF THE INVENTION, AND PREFERRED EMBODIMENTS THEREOF

In certain aspects, the present invention provides a remote controlled docking assembly for a portable digital media storage and playback device that dramatically increases the utility of a portable digital media storage and playback (PDMSP) device. A docking assembly according to the present invention preferably serves as a remotely controllable interface between a PDMSP device and an audio and video reproduction system having a television-compatible display element without requiring the use of a personal computer, while powering and/or charging the PDMSP device. The audio and video reproduction system, which may be disposed in a stationary (e.g., home) or vehicular environment, enables digital media files such as any of music, photos, videos, games, and the like to be reproduced in a form perceptible to many people. By migrating away from a personal computer to an entertainment system as a primary interface for a PDMSP device, the appeal of a PDMSP device is greatly expanded not only for the primary user's sole enjoyment, but also for sharing the entertainment experience with groups of users.

Various embodiments provide additional capabilities such as, for example, telephonic communication, remote controlled media file purchase and organization, and device authentication capabilities. Still further features provided in certain embodiments include wired or wireless network connectivity, interconnectivity with enhanced remote control components and remote controls for other media system devices, and video telephony capabilities.

FIG. **1** illustrates an entertainment system **99** including a docking assembly **10** remotely controllable via a remote controller (preferably a wireless remote controller, although a wired remote controller may be used) and adapted for use in interfacing a portable digital media storage and playback (PDMSP) device **80** with an audio and video reproduction system **2** having a television compatible display element **5**, an (audio) amplifier **4**, and at least one speaker **6**. The PDMSP device **80** has a battery or other charge storage element **81**, and a first display element **82** that is typically a special purpose LCD display or a special purpose LED display. Signals communicated within the PDMSP device **80** for display by the first display element **82** are typically formatted for a special purpose first display element **82**, and such signals are typically not television-compatible. The PDMSP device **80** has an onboard memory element, such as a hard disk drive and/or flash memory, and is preferably adapted to store and

play back digital audio and video files of various formats. The PDMSP device **80** preferably has at least one electrical connector (such as the connector **190** shown in FIG. **2**B) adapted to provide an interface for powering and/or charging PDMSP device **80** as well as providing communication utility. Communication between the PDMSP device **80** and the docking assembly **10** may also be provided through a headphone or auxiliary input port **15** optionally provided in or on the docking assembly **10**. Such auxiliary input port **15** enables the docking assembly **10** to work with a wide variety of different portable digital media storage and playback devices. In one embodiment, the auxiliary input port **15** comprises a 3.5 mm diameter female port adapted to receive both audio and video signals.

The docking assembly **10**, which preferably comprises a unitary body structure (such as the body structure **210**A illustrated in FIGS. **5-6**) has an associated remote controller **50** (preferably a wireless remote controller) with a battery or other charge storage element **51**. The docking assembly **10** may include an internal or external antenna (not shown). If wireless, the remote controller **50** may be adapted to operate at any desirable frequency of the electromagnetic spectrum. For example, a wireless remote controller **50** may include an infrared and/or a radio frequency (RF) transmitter. Operable RF frequencies in one embodiment include a range from about 800 MHz to about 10 GHz. Any desirable frequency suitable for wireless communication of the required bandwidth may be used.

The docking assembly **10** has at least one electrical coupling **12** adapted to mate with one or more corresponding connector(s) of the PDMSP device **80**, with the at least one electrical coupling optionally including one or more coupling (s) adapted to mate with one or more corresponding connector(s) of a wireless remote controller **50**. The at least one electrical coupling **12** preferably includes at least one coupling adapted to mate with the PDMSP device **80**, and at least one coupling adapted to mate with a wireless remote controller **50**. Any coupling of the at least one coupling may protrude into or otherwise be disposed in a recess (e.g., recess **272** shown in FIG. **5**) adapted to receive one of the PDMSP device **80** or the remote controller **50**, or may be elevated (e.g., atop a raised surface portion such as raised surface **271** shown in FIG. **5**) relative to an upper surface (e.g., upper surface **211**C shown in FIGS. **5-6**) of the docking assembly **10**.

As illustrated, the docking assembly **10** includes a wireless remote receiver **14**, preferably disposed on an exposed front surface (e.g., front surface **211**A shown in FIGS. **5-7**) of the docking assembly **10**. (While it is preferred that the remote controller **50** be wireless, if such remote controller is a wired remote, then it is understood that the wireless remote receiver **14** may be omitted.) The docking assembly **10** may further include a remote wireless receiver port **22** to which a secondary remote wireless receiver **38** (e.g., a radio frequency or an infrared receiver) may be communicatively coupled. Such a secondary remote wireless receiver **38** preferably operates at the same frequency or frequency range as a wireless remote controller **50**. If provided, positioning the secondary remote wireless receiver **38** in signal-receiving proximity to the remote controller **50** permits the docking assembly **10** to be placed together with various media system components (e.g., the amplifier **4** and other associated components) in any convenient or aesthetically pleasing environment, such as in a cabinet or closet not necessarily disposed in proximity to (or in a light of sight of) the wireless remote controller **50**.

To provide enhanced remote control capability of, or communication capability with additional components, such as components associated with the audio and video reproduction system **2** (e.g., components such as, but not limited to, the amplifier **4** and various media player devices such as a CD or DVD changer) or a personal computer, the docking assembly **10** may further include a wired remote port **23** permitting communications with a various other media system devices **39**. The wired remote port **23** preferably provides a serial interface. For example, the wired remote port **23** may permit communications with other media or computing devices according to the EIA232 (formerly RS-232) standard and disposed remotely relative to the docking assembly **10**. Other communication protocols may be employed as will be readily apparent to one skilled in the art. Utilization of the wired remote port **23** interconnected with other independently controllable media system device(s) **39** may permit at least certain functions of the docking assembly **10** to be controlled with a wireless remote controller other than the wireless remote controller **50** specifically adapted for use with the docking assembly **10**.

Communication between the docking assembly **10** and various data or media networks **40** may be provided by wired or wireless means. For example, the docking assembly **10** may include at least one (wired) port **25** preferably having an appropriate cable terminator and any filter or electronic communication equipment (e.g., modem, multiplexer, transceiver and/or transducer) appropriate to the cable and communication standard employed. In one embodiment, the port **25** is adapted for Ethernet, Fast Ethernet, Gigabit Ethernet, or 10-Gigabit Ethernet, or other computing device standard communication protocol for use with a telecommunications network **40** that preferably includes connectivity to a distributed network such as the World Wide Web and the Internet. In another embodiment, the port **25** includes a coaxial cable receptacle and cable modem, or fiber optic receptacle and multiplexer/demultiplexer, and is adapted for use with a computing or media network, such as a two-way media network of a cable or satellite telecommunication (e.g., television) provider. In still another embodiment, the port **25** includes a telephonic cable receptacle and telephonic modem and/or direct subscriber line (DSL) modem to enable communication with a wired telephonic communication network.

In certain embodiment, the docking assembly **10** may include an integral wireless network transceiver **19** adapted for communicating with a wireless network **41** that may be connectable to the Internet and/or World Wide Web. The wireless network **41** may include a wireless local area network (WLAN), such as an IEEE 802.16-compliant (WiMax) network, IEEE 802.11-complaint (Wi-Fi) network, an IEEE 802.15.1-compliant (Bluetooth) network, or similar or equivalent networks, such as to permit free or paid transfer of digital media files, digital media file keys, and the like, between a network and the PDMSP device **80** docked with the docking assembly **10**, or between a network and a memory element **44** (e.g., a NAND or other flash memory) associated with the docking assembly **10**. Such a network **41** may further include capability to stream stored digital media content played by the PDMSP device **80** (i.e., when docked to the docking assembly **10**) over the network **41** to a network-connectable remote device (not shown) having an associated audio and/or video reproduction system. For example, a PDMSP device **80** may be docked with the docking assembly **80** in a first location in a first room within a particular facility (e.g., a home or office) having a first audio and video reproduction system receiving media content from the PDMSP device via the audio and/or video ports **30**, **32**, **33** locally disposed at the docking assembly **10**, while media content is simultaneously broadcast via the wireless network transceiver **19** and the network **41** to an appropriate receiving

device (not shown) disposed in a second room of the facility, outside the facility, or even in a remote facility, for reproduction via a second audio and video reproduction system (not shown). The docking assembly **10** may include an internal or external antenna (not shown) adapted for use with the wireless network transceiver **19**. As an alternative to including an integral wireless transceiver **19**, the wired network port **25** may be adapted to connect with a separate wireless transceiver (not shown) providing the same or equivalent wireless communication capability.

The docking assembly **10** may further include a Universal Serial Bus (USB) port **25** to enable connection with other USB-enabled networks (e.g., network **40**) or USB-enabled devices including personal computers or other network appliances (not shown). The USB port may be configured to display the docking assembly and/or any PDMSP device **80** docked thereto as a network drive, and enable transfer of media files, data, and operable programs or applications between the PDMSP device **80** and an interconnected personal computer or network appliance (not shown). The USB port **25** may further be used, for example, to enable configuration, updating, or troubleshooting of the docking assembly **10** with a peripheral device such as personal computer, PDA, or dedicated diagnostic device (not shown).

In one embodiment, the docking assembly **10** includes a wireless telephone transceiver **18** adapted to rebroadcast telephonic signals between a telephone-enabled remote device (e.g., the telephonic remote controller **150** illustrated in FIG. **3** and FIGS. **4**A-**4**B) and a telephonic PDMSP device (such as the telephonic PDMSP device **180** illustrated in FIGS. **2**A-**2**B.) Such a telephonic PDMSP device preferably includes wireless (e.g., cellular) telephone capability and is adapted to execute any of various conventional portable telephone functions such as sending or receiving telephone calls, sending or receiving data such as email or text messages, connecting to wireless data networks, and the like. The term "rebroadcast" in the context of the wireless telephone transceiver **18** refers to the capability to retransmit or otherwise relay incoming telephonic signals from a telephonic PDMSP device to a wireless telephonic device (e.g., the telephonic remote controller **150**) and to similarly receive incoming signals from the wireless telephonic device for forwarding to a transmitter portion of the telephonic PDMSP device. The wireless telephone (rebroadcast) transceiver **18** associated with the docking assembly **10** preferably operates at the same frequency or frequencies as the telephone transceiver **158** associated with a telephonic remote controller device (e.g., the device **150**). Any suitable frequency range may be used, whether analog or digital, and whether fixed frequency or spread spectrum. Preferably, such transceivers **18**, **158** operate at a frequency range of from about 800 MHz to about 10 GHz, specifically including the frequencies of any of 900 MHz, 1.9 GHz, 2.4 GHz, and 5.8 GHz. The term "transceiver" in this context refers to any combination of transmitter and receiver present in the same device (e.g., PDMSP device or remote controller device), whether or not such components are integrated at the microchip level. The wireless telephone transceiver **18** associated with the docking assembly **10** thus transfers user input and output telephonic functions in a seamless fashion from the telephonic PDMSP device (e.g., PDMSP device **180**) to a telephone-enabled remote device (e.g., the telephonic remote controller **150**) while the PDMSP device is docked with the docking assembly **10**, with signals between the PDMSP device and docking assembly **10** preferably being routed through the at least one electrical coupling **12** and mated connector **180**. Such telephonic function transfer provides substantial convenience to the user, since the PDMSP device need not be retrieved and undocked from the docking assembly **10** to screen, send, and/or receive audio or data communications.

Preferably, telephonic signals communicated by the telephone rebroadcast transceiver **18** to the telephonic remote device (e.g., the device **150**) include notification signals and caller identification information sufficient to notify the user of the existence of an incoming call and to provide some identification of the caller, so as to enable the user to assess whether to accept the incoming call. The telephonic remote device, which preferably includes a display (e.g., the display **152** illustrated in FIG. **3**), preferably includes at least one communication (e.g., call) notification elements. A communication notification element may provide any user-perceptible notification signal, and may provide visible notification, audible notification, and/or vibratory or other tactile notification of an incoming or received (and stored) communication such as a telephone call, text message, email message, video message, video conference invitation, digital media file, or the like. Visible notification may be provided via any of the display **152** (or a portion thereof) and a dedicated LED **156** (as illustrated in FIG. **3**) or any other appropriate visible notification element. Audible notification may be provided by the speaker **166** (as illustrated in FIG. **3**) or a dedicated audible notification element such as a ringer. Upon notification of an incoming call, the user may elect to receive the call by activating a user input element **157**. The user may further utilize a user input **157** to optionally pause or mute playback of any digital media stored in the PDMSP device at the time a call is placed or received.

Preferably, digital media files may be played by, or stored to, a telephonic PDMSP device while the telephonic PDMSP device (e.g., device **180**) is sending or receiving telephonic signals (i.e., enabling the user to engage in a telephone call) and the docking assembly **10** is simultaneously engaged in rebroadcast communication of telephonic signals between PDMSP and a remote telephonic device (e.g., remote controller device **150**).

In a preferred embodiment, the wireless telephone transceiver **18** is distinct from the wireless remote receiver **14**, with such elements operating at different frequencies, to permit telephonic and remote control functions to be performed independently from one another. In another embodiment, the wireless remote receiver **14** may be integrated with the wireless telephone transceiver **18** (or at least a receiver portion thereof), with the telephonic and remote control functions utilizing a common frequency range. Such embodiment may promote economies of cost and size in the docking assembly **10** and the telephonic remote controller **150** (as illustrated in FIG. **3** and FIGS. **4**A-**4**B).

A camera port **26** may be provided in the docking assembly **10** to permit interconnection of a camera device **42**, such as may be useful for video telephony and/or to capture video footage of an event for recordation in the PDMSP device **80** and/or a memory device **44** (e.g., a hard drive, flash memory, or other suitable memory format) associated with the docking assembly **10**. The camera device **42** may be integrated into a the docking assembly **10**, but more preferably the camera device **42** is separate from the docking assembly **10** to permit the camera device **42** to be placed in any appropriate position for the desired end use. In one embodiment, the camera device **42** comprises a wireless receiver for use with a wireless camera device (not shown), thus providing enhanced freedom in camera placement for the desired end use. The camera device **42** is preferably adapted to output a compressed data format suitable for transmission over a network, such as a conventional telephonic or cellular network, to

enable video telephony. In a preferred embodiment, the output format and/or data output rate of the camera device **42** is user-configurable to provide an output appropriately tailored to the memory available, network limitations, and/or desired end use.

In one embodiment, a telephonic remote controller includes a camera (e.g., a video camera) and is adapted to send and receive video signals, with received video signals being displayable locally at the telephonic remote controller (e.g., the controller **150** illustrated in FIG. **3** and FIGS. **4**A-**4**B) on the display element **152** to permit video telephony. Preferably, user inputs associated with the telephonic remote controller may be used to enable audio and video reproduction via the local speaker **166** plus local display element **152** and/or on the television-compatible display element **5** that is associated with the audio and video reproduction system **2** communicatively linked to a telephonic PDMSP device (e.g., the device **180**) via the docking assembly **10**.

The docking assembly **10** of FIG. **1** employs various elements requiring direct current (DC) power, such as the microprocessor **45**. To adapt the docking assembly **10** for use with an alternating current (AC) power source **35**, a switching (e.g., rectified) power supply **36** (which is preferably external to the docking assembly **10**) is interposed between the AC power source **35** and a power port **20** provided in the docking assembly **10**. In one embodiment, a DC power adapter (not shown) may be substituted for the power supply **36** to adapt the docking assembly **10** to a DC power source such as may be present in an automobile, recreational vehicle, airplane, or similar mobile environment having an audio and video reproduction system **2**. Within the docking assembly, a power distribution bus **21** provides power at voltages and current levels appropriate to various internal elements, as shown with dashed lines internal to the docking assembly **10** in FIG. **1**. Internal to the docking assembly **10**, at least one charging element **43** is provided to furnish power at appropriate levels to power the PDMSP device **80** and wireless remote controller device **50** and/or charge the batteries associated with the devices **80**, **50** when such devices **80**, **50** are docked with the docking assembly **10** via the at least one electrical coupling **12**. The at least one charging element **43** includes at least one electrically conductive circuit element, with appropriate current transducers preferably provided to sense and permit regulation of current flow so as to minimize the possibility of overcharging the battery **81** associated with the docked PDMSP device **80** and/or the battery **51** associated with the remote controller device **50**. The charging element **43** and/or at least one electrical coupling **12** may further include an associated temperature transducer such as a thermistor or thermocouple (not shown) to provide thermal feedback suitable for regulating electrical charge supplied to the batteries **81**, **51** of the docked device(s) **80**, **50**. In one embodiment, electrical charge is supplied to the docked PDMSP device **80** and/or remote controller device **50** at a first rate while such device batteries **81**, **51** are charging, and then supplied at a second, lower "maintenance" rate when such devices batteries **81**, **51** are fully charged to power the devices **80**, **50** without overcharging their batteries **81**, **51**. When such batteries **81**, **51** are fully charged, the charging element **43** may be used to assist in powering the PDMSP device **80**.

The docking assembly **10** may include various local user controls **17** (e.g., disposed on a front, top, or other accessible surface of the assembly) adapted to control the docking assembly and/or certain functions of a PDMSP device **80** docked thereto. Examples of local controls include power buttons or switches, volume buttons, a mode selector button or switch (e.g., to permit a user to select between any of various audio and video output modes, or between any of various audio or video output formats), and the like. Owing to the enhanced functionality provided by a wireless remote controller device **50**, however, local controls **17** may be minimized in functionality or eliminated altogether if desired.

Local indication of basic functionality such as power on, docking status, communication status, and the like may be provided with one or more LEDs **16**, which are preferably disposed on an outwardly visible portion (e.g., the front surface) of the docking assembly **10**. Multiple LEDs or a smaller number of multi-color LEDs may be employed to provide different status indications, if desired.

A primary function of the docking assembly **10** is to serve as an audio/video interface between a PDMSP device **80** docked thereto and an audio and video reproduction system **2** having a television-compatible display element **5**. Signals (e.g., audio signals, video signals, both audio and video signals, and/or other types of signals) may be communicated between the PDMSP device and the microprocessor **45** of the docking assembly **10** by way of the at least one electrical coupling **12**. The microprocessor **45** preferably communicates with a video processor **46**, a digital signal processor **48**, and an amplifier **49**. In turn, the video processor **46** is communicatively coupled to at least one video port **32** and preferably at least one audio/video port **33** coupleable to the audio/video reproduction system **2**. The digital signal processor **48** (which may be used, for example, to add equalization and/or sound field effects to an audio signal stream) communicates an audio stream to an amplifier **45** (internal to the docking assembly **10**) adapted to adjust the output level of the audio signal to at least one audio port **30** and the audio portion of at least one audio/video port **33** coupleable to the audio/video reproduction system **2**. The output signal level of the amplifier **49** is preferably responsive to a volume input signal, such as may be received via the wireless remote receiver **14** from the wireless remote controller **50**, or received via the local user controls **17** (if provided). Various digital-to-analog signal converters (not shown) may be integrated into any of the video processor **46**, digital signal processor **48**, and microprocessor **45**, or provided downstream of such components, if desired to generate analog output signals from the digital media signal provided by the PDMSP device **80**. The microprocessor **45** and/or video processor **46** may further be used to provide video format conversion utility (e.g., from non-television-compatible formats to television-compatible formats) and to generate any desirable visual output signals (e.g., still images, video images, and/or computer generated display applications such as screensavers, skins, and other visualizations, whether or not synchronized or responsive to audio playback) during the playback of a digital audio file stored in a docked PDMSP device **80**.

Each of the digital signal processor **48** and video processor **46** may include general-purpose or specialty microprocessor chips. While FIG. **1** illustrates the microprocessor **45** as intermediately disposed in communication between the PDMSP device **80** on the one hand and the video processor **46**, digital signal processor **48**, and amplifier **49** on the other, it is to be appreciated that communication paths independent of the microprocessor **45** (but preferably switchably controlled by the microprocessor) may be provided between the PDMSP device **80** and any of the video processor **46**, digital signal processor, and amplifier **49**, if desired. Alternatively, any of the video processor **46** and the digital signal processor **48** may be integrated, in whole or in part, with the (central) microprocessor **45**. The video processor **46** preferably has an associated frame buffer adapted to store an image to be transmit-

ted to the at least one video port **32** and/or the at least one audio/video port **33** for transmission to the audio and video reproduction system **2**.

A PDMSP device **80** may communicate, through an interface connector (e.g., the connector **190** illustrated in FIG. **2**B), various types of signals to an accessory device, such as the docking assembly **10**. Examples of such signal types may include, for example: (a) signals indicative of menu contents; (b) signals containing digital media file or digital media file key identifiers; (c) digital media file content; (d) control signals; (e) status signals, and so on. Such signals are typically not communicated through the interface connector by the PDMSP device **80** in a television-compatible form. As noted previously, signals communicated within the PDMSP device **80** for display by the first display element **82** are typically formatted for a special purpose first display element **82**, and not for a television-compatible display element. Desirable functions of the microprocessor **45** and/or video processor **46** within the docking assembly **10** include processing signals received from the PDMSP device **80** to yield television compatible (e.g., NTSC, PAL, various conventional high definition television formats, or equivalent signal standards) signals communicable to a television-compatible display element **5** through the at least one video port **32** and/or at least one audio/video port **33**. This may be accomplished, for example, by developing television-compatible display menus, storing the same within the docking assembly **10** (e.g., in the memory element **44**), populating the display menus with digital signal data received from the PDMSP device **80**, and providing the populated display menus as a television-compatible signal to the at least one video port **32** and the at least one audio-video port **33**. With the PDMSP device **80** adapted to display an aggregate first set of information with first display element **82** when the device **80** is in use, the docking assembly **10** (including the video processor **46**) is preferably adapted to generate a substantially complete replicate of the first set of information on the television-compatible display element **5** when the PDMSP device **80** is docked with the docking assembly **10**. For example, the docking assembly **10** and video processor **46** are preferably adapted to output a television-compatible video signal containing any of the following: (1) count of any of playlists, artists, albums, genre, songs, and composers; (2) names of any of playlists, artists, albums, genre, songs, and composers; (3) current play status embodying any of song length, song position, and play/pause/stop status; and (4) current song status embodying any of song name, artist name, and album name.

Screen shots taken from a television-compatible display element showing populated menus output from a docking assembly according to the present invention and having a PDMSP device communicatively docked thereto are provided in FIGS. **9**A-**9**C. The first screen shot depicted in FIG. **9**A shows a welcome menu in a central right portion of the screen, listing the following user-selectable options: Menu, Shuffle Songs, Playlists, and HomeDock® Settings. It is noted that "HomeDock," "HomeDock Deluxe," and "DLO," as depicted in FIG. **9**A, are trademarks of Netalog, Inc. (Durham, N.C.). The second screen shot depicted in FIG. **9**B shows a digital media file artist name, song title, album name, song play position, and song length information in an upper portion of the screen, and a settings menu in a central right port of the screen. The setting menu includes the following user-selectable options: Color Themes, Screen Savers, Screen Saver Time, and About HomeDock. The third screen shot depicted in FIG. **9**C shows a music menu in a central right port of the screen, with the music menus including the following user-selectable options: Playlists, Artists, Albums, Songs, Genres, Composers, and Songbooks. In each instance, the user-selectable options are selectable with a remote controller device, such as the devices **50**, **150** described herein. The screen shots depicted in FIGS. **9**A-**9**C are merely illustrative of certain menus according to one embodiment of the invention. Various other menus and displays of static or dynamic information may be provided. In one embodiment, at least a portion of a television-compatible display element **5** displays visual media such as album art, music videos, visualization patterns (whether or not synchronized to music playback), digital skins, or other user-selected images or videos simultaneous with playback of digital music from a PDMSP device (e.g., PDMSP device **80** or **180**) docked with the docking assembly (e.g., docking assembly **10** or **210**). Such visual media may be stored on the PDMSP device itself, stored in a memory **44** associated with the docking assembly **10**, or automatically retrieved over a network (e.g., network **19** or **40**) upon initiation of playback of an audio file. In one embodiment, the displayable visual media includes a list of digital media files selectable for retrieval or download, such as for a fee. In further embodiments, the displayable visual media may include other subscription-based media, commercial programming, or commercial (e.g., product or service) offerings.

Display menus in television-compatible form generated or otherwise provided by the docking assembly **10** may be substantially static in character with substantially still images (e.g., with the exception of audio file playback time or time remaining), or the display menus may include dynamic images, such as to prevent burn-in of a screen image, or to display images (such as digital "skins") selected for visualization with playback of a digital audio file. Alternatively, one or more digital photographic images embodying still pictures, digital video images embodying moving pictures, computer-generated display applications (e.g., screensavers, skins, other visualizations, and/or games) stored on the PDMSP device **80** may be displayed through the second display element **5** when the PDMSP is communicatively docked with the docking assembly **10**. In still another alternative embodiment, digital images, digital video images, and/or computer-generated display applications may be stored in a docking assembly (e.g., in memory element **44** illustrated in FIG. **1**) according to the present invention for playback on a television-compatible display element communicatively connected to the docking assembly.

At least one video signal output from the docking assembly **10** is preferably digital, although digital-to-analog signal conversion may be performed as part of processing video signals as appropriate to the desired output format. Audio signals emanating from the PDMSP device **80**, whether such signals are in substantially unaltered or processed (e.g., by way of the digital signal processor **48** and/or any digital-to-analog converters) form, are further communicated to the at least one audio port **30** and the at least one audio/video port **33**.

Each of the at least one audio port **30**, the at least one video port **32**, and the at least one audio/video port **33** preferably includes multiple connectors to provide an appropriate level of fidelity and compatibility with various external devices in a given user's audio and video reproduction system **2**. Examples of suitable connectors include, but are not limited to, fiber optic connectors, coaxial connectors, RG-6 coaxial connectors, RCA plug connectors, S-video connectors, composite video connectors, Digital Visual Interface (DVI) connectors, High Definition Multimedia Interface (HDMI™) connectors, SCART connectors, Unified Display Interface connectors, and DisplayPort connectors. Audio and video signals may be conveyed via discrete connectors, or inte-

grated into multi-function connectors (e.g., High Definition Multimedia Interface), as desired. Multiple connectors may be enabled simultaneously, such as to permit multiple audio amplifiers **4** and multiple television compatible display elements **5** to receive signals simultaneously from PDMSP device **80** via the docking assembly **10**. In one embodiment, an audio output port is adapted to communicate a line-level analog signal to the external audio amplifier **4**.

Two views of a telephonic PDMSP device **180** are illustrated in FIGS. **2**A-**2**B. The term "telephonic" in this context refers to the ability of the device **180** to execute any of various conventional portable telephone functions such as sending or receiving telephone calls, sending or receiving data such as email or text messages, connecting to wireless data networks, and the like. The PDMSP device **180** includes a first display element **182**, such as a LCD display, a speaker **186**, a microphone **188**, and various controls **183**, **184**, **185**A-**185**D, **188**, **189**. Such controls **183**, **184**, **185**A-**185**D, **188**, **189** may include, for example, a scroll wheel **183** or similar versatile multi-position element, a 'select' button **184**, a 'menu' button **185**A, a 'return or previous file' button **185**B, an 'advance or next file' button, a play/pause button **185**D, and a standard 12-button telephonic keypad **189**. If desired, the display **182** may comprise a touch-screen display to provide further user input utility. The telephonic PDMSP device **180** further includes a connector port **190** for receiving an appropriate electrical coupling connector adapted for charging and/or signal transmission, such as the at least one electrical coupling **12** associated with the docking assembly **10** (or the electrical coupling **212**A associated with the docking assembly **210**A as illustrated in FIG. **5**). The telephonic PDMSP device **180** preferably includes other components (not illustrated herewith) typically provided in either conventional standard telephonic devices and/or conventional digital media storage and playback devices, such as a battery, a microprocessor, a telephone transceiver, an antenna, a memory, and the like. The telephonic PDMSP device **180** is preferably adapted to send and/or receive portable digital media files via a telephonic data network.

FIG. **3** provides a schematic view of a wireless remote controller device **150** for use with a docking assembly (e.g., docking assembly **10** illustrated in FIG. **1**, or assembly **210** illustrated in FIGS. **5**-**7**) adapted to receive a telephonic PDMSP device (such as the telephonic PDMSP device **180** illustrated in FIG. **5**), with the remote controller device **150** including telephonic relay utility and remote control utility to enhance the functionality of the telephonic PDMSP device **180**. The remote controller device **150** preferably includes a microprocessor **155** having an associated memory **164** and adapted to execute a pre-defined instruction set. The remote controller device **150** includes a battery **151** (or equivalent charge storage element) suitable to supply electrical power to various power-consuming elements within the device **150**. A charging element **163** preferably includes at least one electrical contact (such as the contacts **162** shown in FIG. **4**B for mating with corresponding contacts of a docking assembly) and any suitable electrical circuit element(s) to furnish power at appropriate levels to charge the battery **151** and/or to power directly any of various power-consuming elements within the controller **150**. The charging element **163** is perfectly controlled by the microprocessor **155**, and a temperature sensor **161** may be provided to provide a thermal feedback signal in order to avoid overcharging. A current sensing element (not shown) is preferably provided to further monitor current supplied to the battery **151** or any other element within the device **150** to minimize excess current or overcharging. As illustrated, the remote controller **150** includes raised portions **169**A, **169**B along a rear surface thereof to register with corresponding lateral recess portions **269**A, **269**B disposed along one edge of a cavity or recess **272** in a docking assembly **210** (as illustrated in FIG. **5**) and adapted to receive the remote controller **150**

To provide telephonic relay utility, the remote controller device **150** may include an integrated telephone relay transceiver **158** (or, alternatively, a telephone relay transmitter and a separate telephone relay receiver), a speaker **166**, and a microphone **168**. Audio input/output functions may be managed by an audio input/output element **160** interposed between the telephonic transceiver **158** and the speaker **166** and microphone. An audio amplifier **167** is preferably associated with the speaker **166** to provide an appropriate audio output level. The telephone relay transceiver **158** is preferably adapted to communicate with a wireless telephone transceiver (e.g., the telephone transceiver **18** illustrated in FIG. **1**) associated with a docking assembly **10** (as illustrated in FIG. **1**).

To provide remote control utility, the remote control device **150** includes a remote control transmitter **154** preferably having a microprocessor and various user inputs **157** (such as buttons, touch screens, scroll wheel elements, or the like) in communication with the microprocessor **155** to control remote control and/or telephone functions. A speech recognition element **161**, preferably in communication with the microprocessor **155** and memory **164**, may be provided to recognize vocal inputs and generate command signals transmissible to the docking assembly **10** either via the remote control transmitter **10** or the telephone transceiver **158**. The speech recognition element **161** preferably includes a processor and a software routine operable with the processor and a memory (e.g., the memory element **164**). If desired, the speech recognition element may be substantially integrated into the microprocessor **155**. In an alternative embodiment, the speech recognition element **161** may be provided in a docking assembly (e.g., the docking assembly **10** illustrated in FIG. **1**) rather than provided in the remote controller **150**, such that voice signals are communicated from the telephonic remote controller **150** to the docking assembly and then analyzed in the docking assembly to recognize specific vocal inputs and generate appropriate command signals.

The remote controller **150** preferably includes an integrated display **152** and an associated backlight **152**A. Such display may be used for various functions, including: display of caller identification signals; display of a video portion of a video telephony signal; providing visible incoming or received communication notification; providing text data; and providing visible indication or identification of any of: input signals (e.g., telephone numbers or remote control commands) entered by a user, call time, signal strength, battery life, telephone mode, telephone settings, controller mode, controller settings, calls missed, calls received, calls made, contact information, accumulated monetary charges (e.g., for telephone use or digital media purchases), debits remaining, diagnostic signals, and so on.

The remote controller **150** may further include an interface element **159**, preferably including a connector adapted to mate with at least one electrical coupling **12** of the docking assembly **10**, or to mate with an external device such as a personal computer (not shown) to permit programmatic updates of software associated with the remote controller **150**, or to permit troubleshooting. In one embodiment, the interface element **159** is adapted to engage a connector associated with a video game controller device (not shown), such as a gamepad or joystick, to facilitate wireless control of a video game stored in a PDMSP device, with audio and video

reproduction of the game play being provided through an audio and video reproduction system (e.g., the system **2** illustrated in FIG. **1**) communicatively coupled to the docking assembly. In one embodiment, the interface element **159** includes a USB connector. The interface element **159** may further include any necessary circuitry to enable communication with the microprocessor **155** (or any other appropriate internal element) of the remote controller **150**.

In another embodiment utilizing a telephonic remote controller **150**, a docking assembly **10** (as illustrated in FIG. **1**) receives a telephonic signal (e.g., a conventional telephone signal or Voice Over Internet Protocol telephonic signal) independent of any PDMSP device, via any of the wireless network transceiver **19**, the network port **24**, or a wired telephone input port (not shown) operable with a conventional telephone line, and the telephonic remote controller **150** is adapted to receive such telephonic signal and provide a compatible output signal. In this manner, the telephonic remote controller **150** may serve as a multi-line telephone transceiver in communicating telephonically with one telephone signal routed through a telephonic PDMSP device (e.g., PDMSP device **180**) to function as a telephone relay receiver, and in communicating telephonically with another telephone signal made available to the docking assembly **10** to function as a conventional cordless telephone. Incoming communication signals may be routed automatically to the remote controller **150**. In case one communication is in progress and an incoming communication signal is received, switching between telephone lines may be performed via the remote controller **150** with any of the user inputs **157** (e.g., inputs **157**A-**157**I illustrated in FIG. **4**A).

Front and bottom external views of a telephonic remote controller device **150** according to one embodiment are illustrated in FIGS. **4**A-**4**B, respectively. The remote controller device **150** includes a display element **152** (e.g., a LCD or LED display) suitable for displaying alphanumeric characters. In another embodiment (not shown), a display element adapted to further display still or video images in addition to alphanumeric characters may be provided. The remote controller device **150** includes a speaker **166** and a microphone or speech transducer **168**. An LED **156**, such as a multi-color LED, is preferably provided for communication (e.g., incoming call) notification. Vibratory communication notification may be provided via a vibratory element (not shown) within the remote controller **150**. A twelve-key telephonic keypad **157**X is preferably provided to readily permit telephone dialing and text messaging, if desired. The keypad **157**X is preferably also enabled for remote control of an associated docking assembly for a PDMSP device. Various additional control keys **157**A-**157**I are preferably provided to control various functions associated with the docking assembly, docked PDMSP device, associated network (e.g., to select digital media files and authorize their purchase or download by the user), and/or components associated with the audio and video reproduction system **2**. Such controllable functions may include, without limitation, the following illustrative examples: media source, media identification, playlist identification, media selection, playback speed, playback volume, operating mode, output mode, telephone operation, and so on. Various functions may be controlled with the aid of "on screen" menus displayable on the local display **152** and/or (more preferably), menus displayable on the television-compatible second display element **5**.

FIGS. **5**-**6** provide perspective and side elevation views, respectively, of a docking assembly **210** operable with the PDMSP device **180** of FIGS. **2**A-**2**B and the telephonic remote controller device **150** of FIGS. **4**A-**4**B. The docking assembly **210** may include any of the various elements illustrated and described previously herein in connection with the docking assembly **10** illustrated in FIG. **1**. The docking assembly **210** includes a unitary body structure **210**A having a front surface **211**A, back surface **211**B, top surface **211**C, bottom surface **211**D, and side surfaces **211**E, **211**F. A wireless remote receiver **214** is preferably disposed on the front surface **211**A of the body structure **210**A to facilitate unobstructed communication with the wireless remote controller **150**. Further disposed on the front surface **211**A is at least one LED **216** to provide a user with visible indication of events such as power on, signal received, docking status, and so on. The at least one LED **216** may include at least one multicolor LED to communicate various information based on output color, and/or a plurality of different LEDs. Various ports (e.g., audio port **230**A) are preferably provided on the back surface **211**B to minimize the outward appearance of clutter, assuming that the front surface **211**A is facing forward.

The docking assembly **210** includes a raised surface portion **271** having an upwardly-protruding electrical coupling **212**A adapted to mate with an associated connector **190** of a PDMSP device **180** (such as illustrated in FIG. **2**B). Each of the coupling **212**A and connector **190** preferably includes a plurality of electrical contacts, sufficient to communicate power or charging current and low-power signals, such as command signals and signals representative of digital media content. Disposed behind the raised surface portion **271** is a reclined support element **275** having corner braces **277** to promote structural rigidity. The front-to-back position of the support element **275** may be adjusted by sliding a horizontal portion **274** of the support element **275** within a recess or track **273** and actuating a set screw **274**A to lock the support element **275** in a desired position. The support element **275**, or at least a front surface **275**A thereof, preferably includes a non-slip cushion element **276**, such as may be fabricated of silicon rubber or another suitable non-slip material. Providing the coupling **212**A on a raised surface portion **271** adjacent to the adjustable support element **275** permits the fixed coupling **212** to work with a variety of PDMSP devices of various sizes and in (e.g., thicknesses) so long as each PDMSP device has a connector **190** compatible with the coupling **212**. In an alternative embodiment, the coupling **212**A may be disposed substantially within a recess (not shown) that is substituted for the raised surface portion **271** and is adapted to receive and retain a PDMSP device.

The docking assembly **210** further includes a recess **272** adapted to receive at least a portion of the wireless remote controller **150** illustrated in FIGS. **4**A-**4**B. Disposed along a bottom surface of the recess are electrical contacts **212**B, such as may be used to communicate powering or charging current to the remote controller **150** via corresponding contacts **162** disposed along a bottom surface of the controller **150**. The recess **272** may further include a multi-contact electrical coupling (not shown) adapted to mate with the connector **159** of the remote controller device **150** to exchange communication signals (e.g., for troubleshooting, reprogramming, frequency synchronization, or other desirable functions) between the remote controller **150** and the docking assembly **210** when the remote controller **150** is docked thereto. The recess **272** further includes lateral recess portions **269**A, **269**B disposed along a rear edge of the recess **272**, with such lateral recess portions **269**A, **269**B adapted to receive corresponding raised portions **169**A, **169**B of the remote controller **150** to prevent mis-insertion of the remote controller **150** into the recess **270**.

FIG. **7** provides a front view of the docking assembly **210** of FIGS. **5**-**6** having docked thereto the portable digital media storage and playback device **180** of FIGS. **2**A-**2**B and the

telephonic remote controller device **150** of FIGS. **4**A-**4**B. When docked to the docking assembly **210**, a battery (e.g., battery **151** illustrated in FIG. **3**) associated with the remote controller **150** is preferably charged via the passage of electrical current through the charging element **163** as received from the mated contacts **162**, **212**B. Likewise, when docked to the assembly **210**, the PDMSP device **180** preferably receives electrical current to power the device **180** and/or charge an associated PDMSP device battery **81** (as illustrated in FIG. **1**) In operation of the docking assembly **210** with docked PDMSP device **180**, the remote controller device **150** is separated from the assembly and used to wirelessly control any of various functions (e.g., associated with the docking assembly **210**, PDMSP device **180**, and/or an audio and video reproduction system **2** as illustrated in FIG. **1**), to provide telephonic relay or primary telephonic utility, or to provide any other functionality as described herein.

One way to ensure or regulate interoperability between an accessory device (such as a multi-function docking assembly) and a PDMSP device is through the use of authentication technology. In a preferred embodiment, a docking assembly and a PDMSP device each include an authentication element, such as an integrated circuit, adapted to communicate with one another to execute an authentication scheme employed at least the first time that the accessory device is connected to the PDMSP device, with successful authentication being a prerequisite for the transfer of any substantive content or control signals between the PDMSP and the accessory device. Preferably, a challenge and response-based authentication scheme is employed.

Examples of integrated circuits that may be used to provide or easily adapted to provide such functionality include: the Texas Instruments BQ26150-family of ICs (including models BQ26150DCKR and BQ26150DCKRG4) (Texas Instruments Inc., Dallas, Tex.); the Dallas Semiconductor/Maxim DS2703-family of ICs (including models DS2703U and DS2703U+)(Maxim Integrated Products, Sunnyvale, Calif.); and the Intersil ISL6296 family of ICs (Intersil Corp., Milpitas, Calif.).

FIG. **8** provides a block diagram of a preferred coupled combination of a PDMSP device **380** and a remotely controllable docking assembly **310** adapted to provide authentication utility. The docking assembly **310** includes at least one electrical interface coupling (e.g., coupling **12** illustrated in FIG. **1**) that mates with a corresponding at least one electrical connector (e.g., connector **190** illustrated in FIG. **2**B) associated with the PDMSP device.

A PDMSP device (such as the devices **80**, **180** described hereinabove) preferably includes a central processing unit (CPU), such as a complex instruction set computer microcontroller (not shown) that interfaces with various other components, various user input elements, and a data storage element (not shown) typically including any of a rotating disc (hard drive or microdrive) and flash memory to store various media files in addition to other data files and/or executable programs. An authentication element, such as an authentication integrated circuit, is preferably communicatively coupled with the connector **190** (as shown in FIG. **2**B), whether directly or through the CPU. If desired, an authentication element may be integrated with the CPU of a PDMSP device. Such an authentication element may be used to authenticate (e.g., validate to enable communication or other interoperability) an accessory device such as a docking assembly for use with the PDMSP device.

Preferably, an authorization element comprises an integrated circuit and a memory, with the memory preferably including both a public memory for storing unencrypted communicable information and secret or encrypted information. An authorization element is preferably reprogrammable, such as by way of connection to a data exchange connector (e.g., connectors **159** or **190** as described hereinabove) that may be linked to an appropriate device such as a personal computer or PDA to accomplish reprogramming functions if desired. Such reprogramming utility may be desirable, for example, to enable use of a docking assembly with newly released or updated PDMSP devices having potentially new and different authentication data or authentication schemes.

FIG. **8** provides a functional block diagram for a basic challenge and response-based authentication scheme that may be utilized by and between a remote controlled docking assembly **310** and a PDMSP device **380**, each having an associated authentication element **313**, **395**. In a basic challenge and response scheme, the "host" or "challenger" (e.g., authentication element **395** associated with the PDMSP device **410**) sends a random challenge to the "responder" (e.g., authentication element **313** associated with the docking assembly **310**) upon initial connection between the two. A random challenge may consist of a number of bits of random data generated by the host. Each authentication element **313**, **395** preferably includes a memory for storing certain authentication information, with the memory of at least the docking assembly authentication element **313** preferably being reprogrammable. The memory of each authentication element **313**, **395** preferably includes both a private memory (e.g., for including unencrypted information and/or a secret key that is preferably not subject to transmission) and a public memory (e.g., for including encrypted information and/or a public key, unique device ID, or other less sensitive information). Using stored information, the responder **313** processes the host-transmitted challenge information (e.g., by performing an authentication transform or computation, preferably utilizing the secret key or some information derived therefrom such as a public key) to produce a response string for transmission back to the host **395**. On the other side, the host **395** performs the same authentication transform using stored information, or some combination of stored information and information communicated by the responder (e.g., an encrypted key passed by the responder **313**). The result compares the transform value computed by the host **395** against the response (transform value) obtained from the responder **313**. If the calculated data from the responder matches the answer calculated by the host, then the host authenticates the responder and allows the PDMSP device and the accessory device to start operation and/or substantive communication. Otherwise, the authentication fails, and the authentication element (either alone or in with the aid of a microprocessor) may inhibit operation of the interconnected PDMSP device **380** and docking assembly **310** and provide a warning signal to the user, e.g., through a display element associated with the PDMSP device **380**, through a display element connected with the docking assembly **310**, and/or a LED (not shown) provided on the docking assembly **310**.

In one embodiment, a challenge-and-response authentication scheme may utilize cyclic redundancy check (CRC) in an authentication transform. Challenges and keys of various bit lengths may be used. In one embodiment, a 32-bit random challenge and 96-bit secret ID are used in conjunction with a random polynomial and 16-bit seed value to generate a 16-bit CRC response. A unique CRC polynomial, CRC seed, and device ID value may be used in each device. Such values may be stored as encrypted text in public memory and unencrypted (plain) text in private memory, such that only a host system can decrypt the polynomial, seed, and ID values using a stored secret key. To authenticate a responder, the host reads

the encrypted device ID, polynomial, and seed values from public memory, decrypts these values using a secret key, and then generates a (e.g., 32-bit) random challenge. The random challenge is transmitted to the responder, which uses challenge information from the host along with the plain-text version of polynomial coefficients, seed, and device ID to calculate the authentication CRC value. The host uses the polynomial coefficients, seed, and device ID that it decrypted, along with the random challenge that it sent to the responder to calculate the authentication CRC value. The responder authentication CRC value may be transmitted back to the host where the two authentication CRC values are compared, with a match serving to authenticate the responder and initiate system operation and/or substantive communication.

In another embodiment, a challenge-and-response authentication scheme may utilize an iterative hashing algorithm such as the SHA-1/HMAC secure hash algorithm, which has been widely used for authentication of Internet transactions. The authentication method is similar to a CRC-based scheme except it utilizes a different algorithm. The host reads a (e.g., 128-bit) encrypted device ID from the public memory and decrypts those values using the secret key to yield plain-text information with root keys. Then it generates a (e.g., 160-bit) random challenge that is transmitted to the responder, which uses the plain-text version of the ID along with the random challenge to calculate an authentication digest value. The host uses the decrypted ID and the same random challenge to calculate its own authentication digest value. When both digest values have been calculated, the host reads the authentication digest value from the responder and compares that value to its own authentication digest value. If a match is obtained, then the responder is authenticated and system operation and/or substantive communication may be initiated.

In one embodiment, an authentication element employs the Secure Hash Algorithm (SHA-1) specified in the Federal Information Processing Standards Publication Numbers 180-1 and 180-2, and ISO/IEC 10118-3. An authentication IC embedded in the accessory device processes a host transmitted challenge using a stored secret key and unique ROM ID to produce a response word for transmission back to the host. The secret key is securely stored on-chip and never transmitted between the battery and the host. If each of the secret key and the ROM ID includes 64 bits, then in a preferred embodiment the response may include 160 bits.

Remotely controllable docking assemblies as described herein for use with PDMSP devices enable various novel methods, including, for example, methods for downloading or otherwise obtaining digital media, and methods for creating or modifying digital media playlists.

In one embodiment, digital media files or digital media file keys may be downloaded or transferred using a remotely controlled docking assembly as described herein to which a PDMSP device is docked. The term "digital media file key" as used herein refers to any code, script, data file, or the like adapted to make readable (whether temporarily or permanently) an otherwise unreadable (e.g., encrypted) digital media file. For example, a digital media file including copyrighted content may be encrypted by the creator or distributor to deter copying, with digital media file keys being distributed to consumers for a subscription or other fee to enable encrypted digital media files to be read. Such a scheme employing digital media file keys is amenable to rapid or frequent updates by the copyright holder to better maintain control over copyrighted works. Furthermore, it permits encrypted files to be distributed via a variety of sources, such as the Internet and/or other networks, to maximize availability to potential buyers, and enables encrypted files to be cached in local high-speed data repositories to facilitate rapid user downloads.

FIG. **10** provides a flowchart of a method for selecting and downloading digital media files or digital media file keys employing a remotely controllable docking assembly as described herein and a PDMSP device docked thereto. The method **400** includes multiple illustrative steps. A first step **402** includes communicatively coupling, via a remotely controllable docking assembly, a portable digital media storage and playback device having a first display element with an audio and video reproduction system having a television-compatible second display element. A second step **404** includes establishing a connection to a media source such as a network (e.g., the Internet, World Wide Web, digital cable (television) network, telephonic network, or other media network). A third step **406** includes displaying on the second display element information indicative of at least one digital media file and/or digital media file key obtainable from the media source. Such information may include title, artist, producer, label, distributor, genre, cost information, and the like. A fourth step **408** includes selecting, using the remote controller (preferably a wireless remote controller, although a wired remote controller may be used), a digital media file and/or digital media file key for download or transfer to the portable digital media storage and playback device. A fifth step **410** includes authorizing a financial obligation or financial transfer using the remote controller, in exchange for download or transfer of a digital media file and/or digital media file key. Such step may include initiating communication of confidential information, such as information enabling billing to or debiting from a financial or commercial account. An optional intermediate step includes utilizing the remote controller to initiate previewing (i.e., playback) of one or more portions of a digital media file on the audio and video reproduction system communicatively coupled to the docking assembly prior to the purchase authorization step. In another embodiment, the user can employ the remotely controlled docking assembly to initiate transfer of a digital media file from the docked PDMSP device to a remote device via a network. Digital media files subject to download or transfer according to the foregoing method steps include audio files, image files, video files, text files, skins, interactive games, and the like. Utilizing a docking assembly and remote controller as described herein and employing the foregoing method steps, a user can download or otherwise transfer digital media files to and from a PDMSP device without requiring a personal computer as the primary PDMSP device interface.

FIG. **11** provides a flowchart of a method for creating or modifying playlists for use with a PDMSP device utilizing a remotely controlled docking assembly as described herein. The method **450** includes multiple illustrative steps. A first step **452** includes communicatively coupling, via a remotely controllable docking assembly, a portable digital media storage and playback device having a first display element with an audio and video reproduction system having a television-compatible second display element. A second step **454** includes creating or retrieving a playlist using a remote controller (preferably a wireless remote controller, although a wired remote controller may be used), with information indicative of the created or retrieved playlist displayed on the second display element. A third step **456** includes displaying information indicative of at least one digital media file stored on the portable digital media storage and playback device on the second display element. A fourth step **458** includes selecting for addition to or deletion from the created or retrieved playlist the at least one digital media file using the remote

controller. A fifth step **460** includes selecting for storage on the portable digital media storage and playback device and/or a memory associated with the remotely controllable docking assembly the modified playlist. In this manner, a user can manage playlists in comfort without requiring a personal computer as a primary interface for the PDMSP device.

Remotely controllable docking assemblies as described herein for PDMSP devices thus provide substantial utility to users by expanding the entertainment capabilities of PDMSP devices beyond personal enjoyment, and minimize the need to rely on a personal computer for primary PDMSP device interface.

While the invention has been described herein with respect to various illustrative aspects, features and embodiments, it will be recognized that the invention is not thus limited, but that the present invention extends to and encompasses other features, modifications, and alternative embodiments, as will readily suggest themselves to those of ordinary skill in the art based on the disclosure and illustrative teachings herein. The claims that follow are therefore to be construed and interpreted as including all such features, modifications and alternative embodiments, within their spirit and scope.

What is claimed is:

1. A method comprising the steps of:

communicatively coupling, via a remotely controllable docking assembly

(1) a portable digital media storage and playback device having a first display element, with

(2) an audio and video reproduction system having a television-compatible second display element and a first audio amplifier adapted to drive at least one speaker,

wherein the remotely controllable docking assembly comprises:

(i) an externally accessible video output port adapted to communicate a television-compatible video signal to the second display element via interface cable connectable to the video output port, and

(ii) a video processor adapted to communicate to the video output port a television-compatible video signal indicative of a signal received from the portable digital media storage and playback device for display by the second display element, and wherein the docking assembly has an associated remote controller;

(iii) A microprocessor adapted to receive and process signals from the portable digital media storage and playback device to yield television compatible communicable to a television-compatible display element of the playback device through at least one video port and/or at least one audio/video port, the microprocessor being disposed in communication with or otherwise switchably controlling a communication path between the portable digital media storage and playback device and the video processor, a digital signal processor of the docking assembly and an amplifier of the docking assembly, wherein receiving and processing signals from the portable digital media storage and playback device to yield television compatible signals communicable to a television-compatible display element of the playback device through the at least one video port and/or at least one audio/video port comprises developing television-compatible display menus, storing the television-compatible display menus within a storage element of the docking assembly, populating the display menus with digital signal data received from the portable digital media storage and playback device and providing the populated display menus as a television-compatible signal to the at least one video port and at least one audio port,

(iv) a wireless telephone transceiver adapted to rebroadcast telephonic signals between a telephone-enabled remote device and the portable digital media storage and playback device,

(v) a remote control receiver adapted to receive an input signal from a wireless remote control device and to provide an output signal to the microprocessor,

(vi) the digital signal processor adapted to adjust the output level of an audio signal to at least one audio port,

displaying on the second display element information indicative of any of (1) a digital media file, and (2) a digital media file key, as available for download or transfer to the portable digital media storage and playback device; and

selecting for download or transfer of any of the digital media file and the digital media file key using the remote controller.

2. The method of claim **1**, wherein the digital media file comprises a digital audio file.

3. The method of claim **1**, wherein the digital media file comprises a digital video file.

4. The method of claim **1**, wherein the digital media file comprises a digital skin or an interactive game.

5. The method of claim **1**, wherein the displaying step includes displaying on the second display element information indicative of a digital media file, and the selecting step includes selecting a digital media file.

6. The method of claim **1**, wherein the displaying step includes displaying on the second display element information indicative of a digital media file key, and the selecting step includes selecting a digital media file key.

7. The method of claim **1**, further comprising the step of initiating communication of confidential information using the remote controller as a condition of initiating download or transfer of the selected digital media file or digital media file key.

8. The method of claim **7**, wherein the confidential information comprises information enabling billing to or debiting of a financial or commercial account.

9. The method of claim **1**, further comprising the step of authorizing a financial obligation or financial transfer in exchange for download or transfer of the selected digital media file or digital media file key.

10. The method of claim **1**, wherein the remote controller comprises a wireless remote controller.

11. The method of claim **1**, further comprising the step of authenticating the docking assembly for communication with the portable digital media storage and playback device.

12. The method of claim **11**, wherein each of (1) the docking assembly and (2) the portable digital media storage and playback device includes an authentication element comprising an integrated circuit, and each integrated circuit is utilized in the authentication step.

13. The method of claim **12**, wherein the authentication step employs a challenge and response authentication scheme.

14. The method of claim **1**, further comprising at least one step selected from (1) powering the portable digital media storage and playback device, and (2) charging a battery associated with the portable digital media storage and playback device, wherein the at least one step is performed while the portable digital media storage and playback device is communicatively coupled with an audio and video reproduction system via the remotely controllable docking assembly.

15. The method of claim 1, further comprising the step of employing the remote controller to initiate reproduction of a digital media file through the audio and video reproduction system.

16. The method of claim 15, wherein the digital media file comprises a digital video file.

17. A kit, comprising a remotely controllable docking assembly and a remote controller, adapted to perform the method of claim 1.

18. An entertainment system comprising the kit of claim 17 and the audio and video reproduction system.

19. An entertainment system comprising the kit of claim 17 and the portable digital media storage and playback device.

20. The method of claim 1, wherein the second display element comprises any of a television, a CRT monitor, a LCD monitor, a plasma monitor, a projection monitor, and a digital projector.

21. The method of claim 1, wherein any of the first audio amplifier and the at least one speaker is integrated with the television-compatible second display element.

22. A method comprising the steps of:

communicatively coupling, via a remotely controllable docking assembly,

(1) a portable digital media storage and playback device having a first display element, with

(2) an audio and video reproduction system having a television-compatible second display element and a first audio amplifier adapted to drive at least one speaker,

wherein the docking assembly includes:

a microprocessor adapted to receive and process signal from the portable digital media storage and playback device to yield television compatible signal communicable to a television-compatible display element of the playback device through at least one video port and/or at least one audio/video port, the microprocessor being disposed in communication with or otherwise switchably controlling a communication path between the portable digital media storage and playback device and the video processor, a digital signal processor of the docking assembly and an amplifier of the docking assembly, wherein receiving and processing signal from the portable digital media storage and playback device to yield television compatible signals communicable to a television-compatible display element of the playback device through at least one video port and/or at least one audio/video port comprises developing television-compatible display menus, storing the television-compatible display menus within a storage element of the docking assembly, populating the display menus with digital signal data received from the portable digital media storage and playback device and providing the populated display menus as a television-compatible signal to the at least one video port and at least one audio port,

an externally accessible video output port arranged to receive an interface cable and being adapted to communicate to the video output via the microprocessor a television-compatible video signal indicative of a signal received from the portable digital media storage and playback device for display by the second display element, and

wherein the docking assembly has associated therewith a remote controller;

authenticating the docking assembly for communication with the portable digital media storage and playback device, wherein each of (a) the docking assembly and (b) the portable digital media storage and playback device includes an authentication element comprising an integrated circuit utilized in the authentication step;

displaying on the second display element information indicative of any of

(i) a digital media file, and

(ii) a digital media file key, as available for download or transfer to the portable digital media storage and playback device; and

selecting for download or transfer of any of the digital media and the digital media file key using the remote controller.

23. A kit, comprising a remotely controllable docking assembly and a remote controller, adapted to perform the method of claim 22.

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